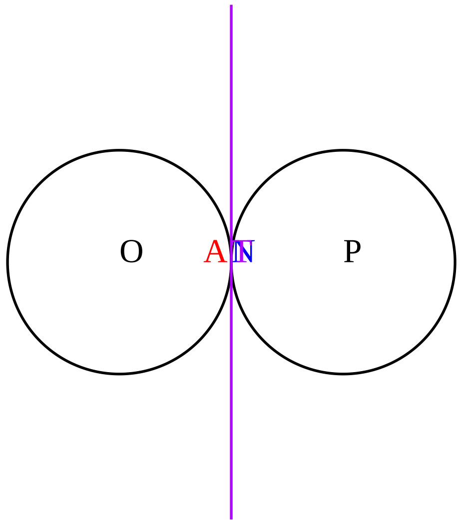
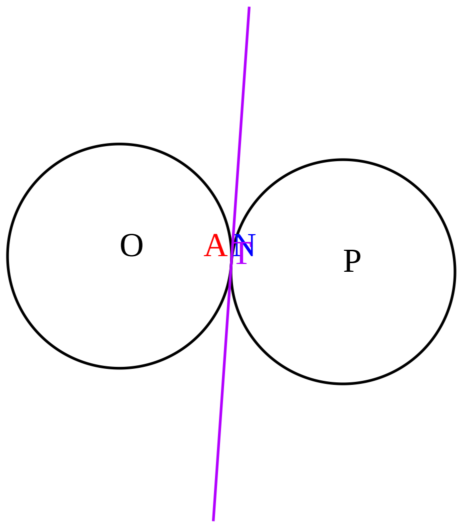
Math 308

Project Topic: Cardioid

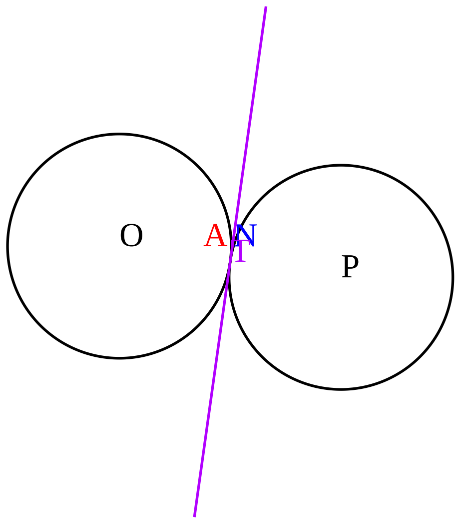
Presented by: Hung Ngai (Simon), Leung



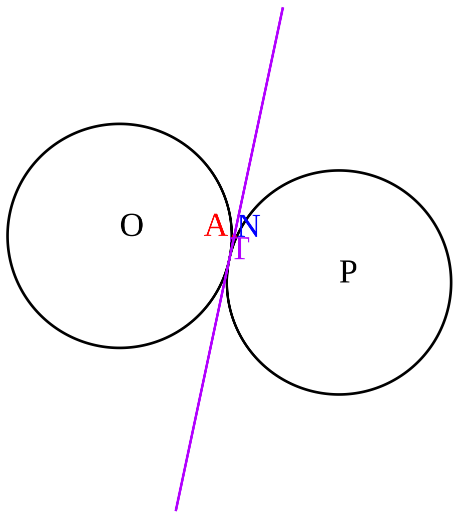
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



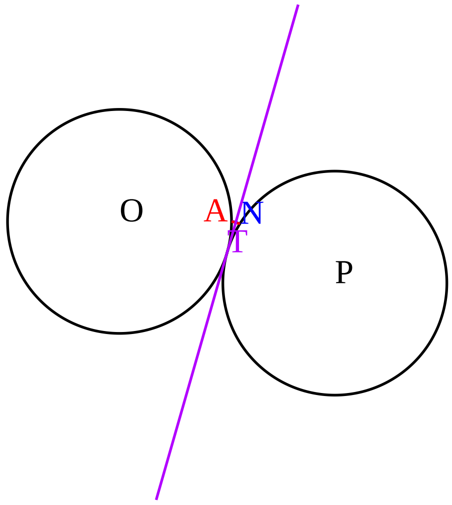
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



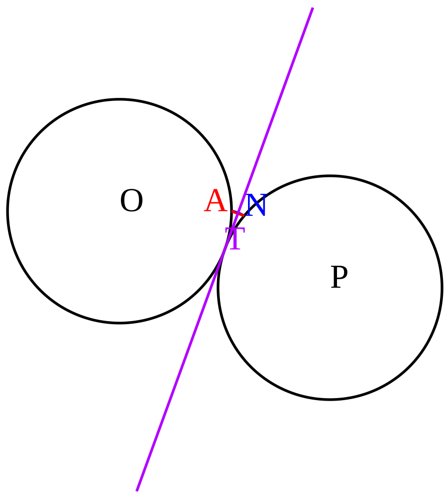
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



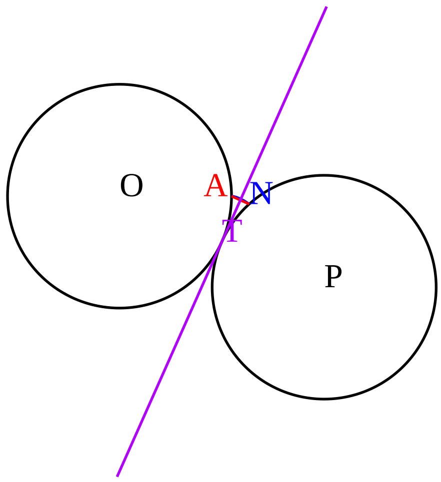
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



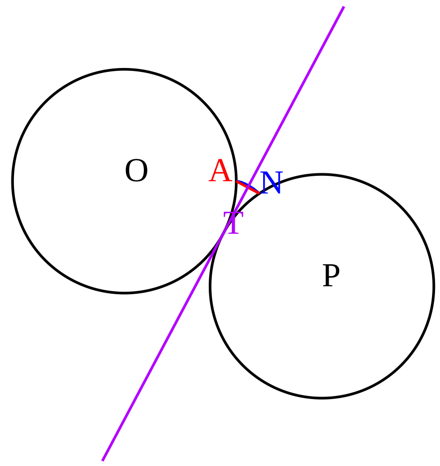
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



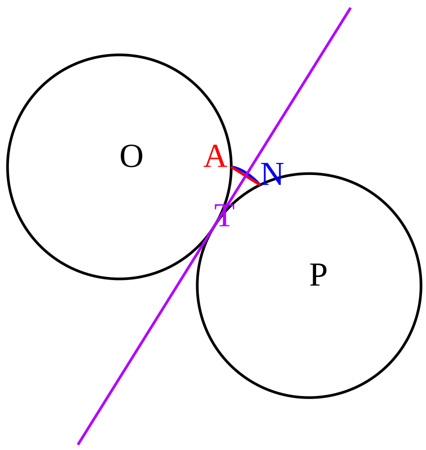
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



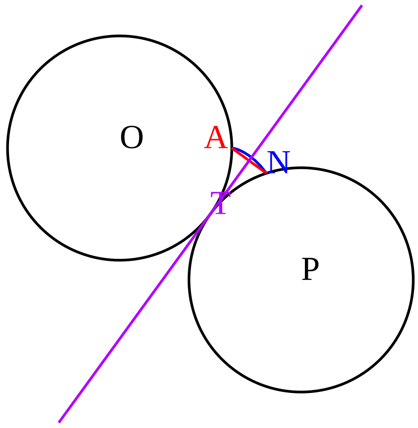
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



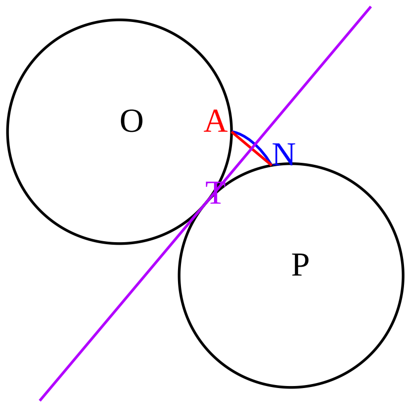
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



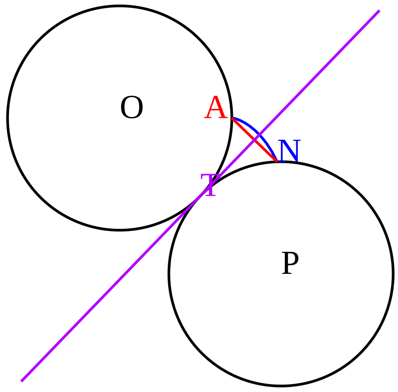
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



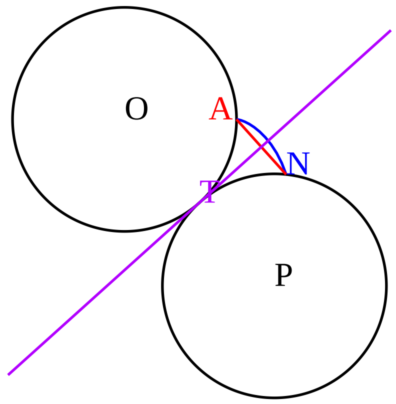
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



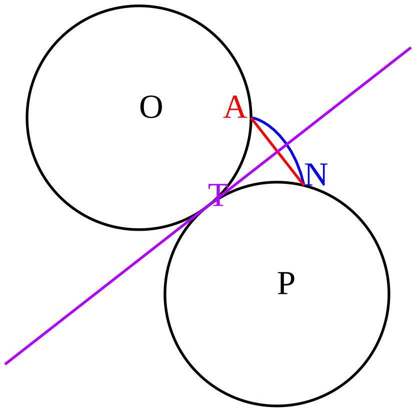
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



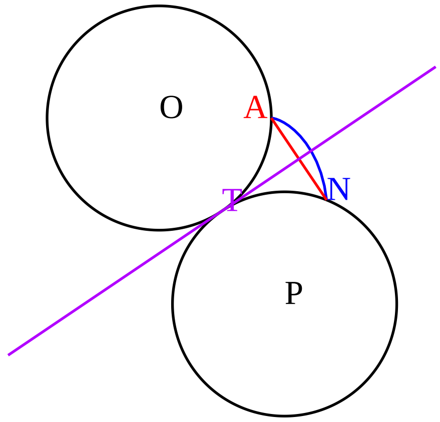
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



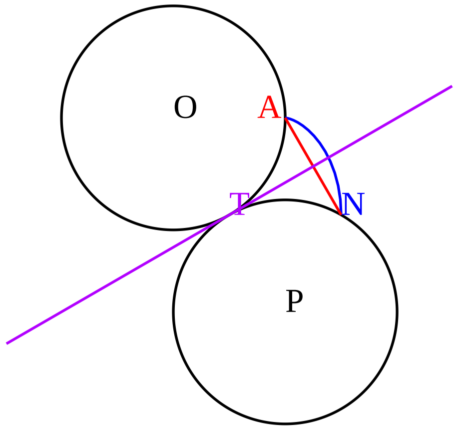
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



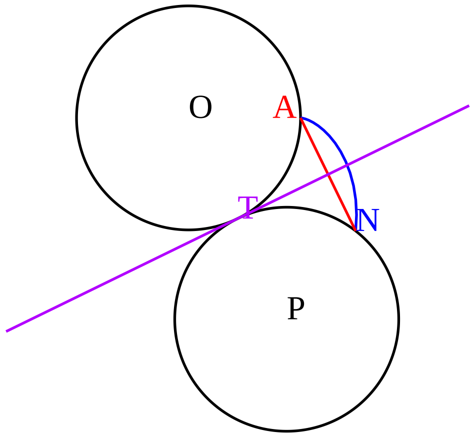
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



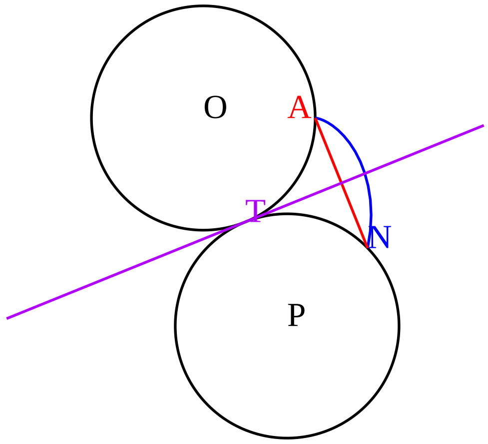
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



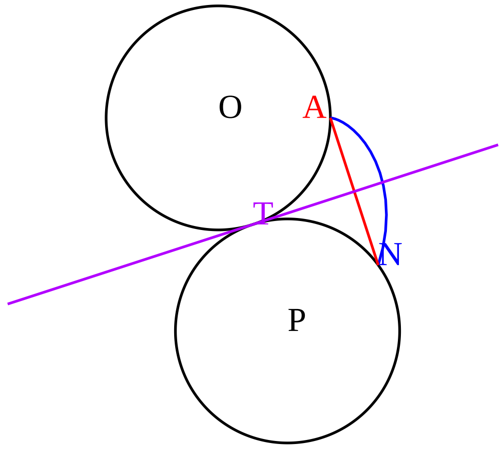
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



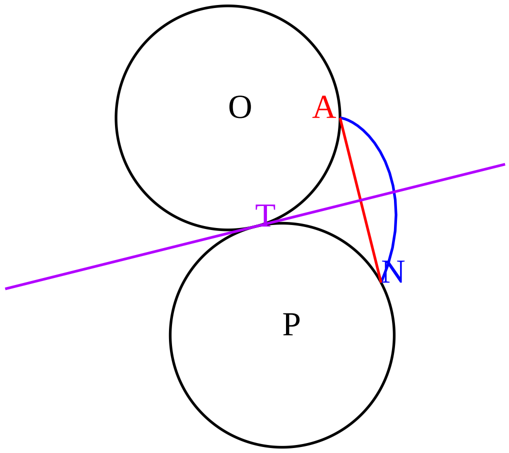
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



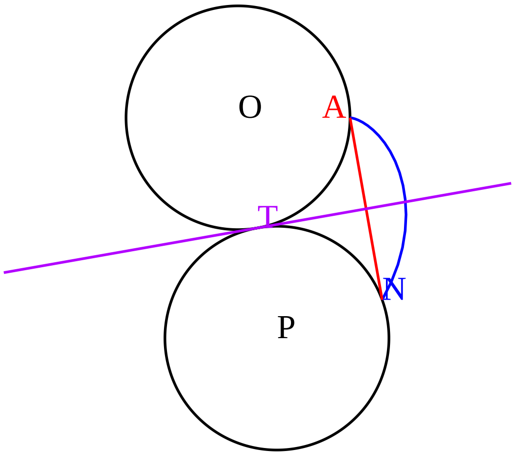
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



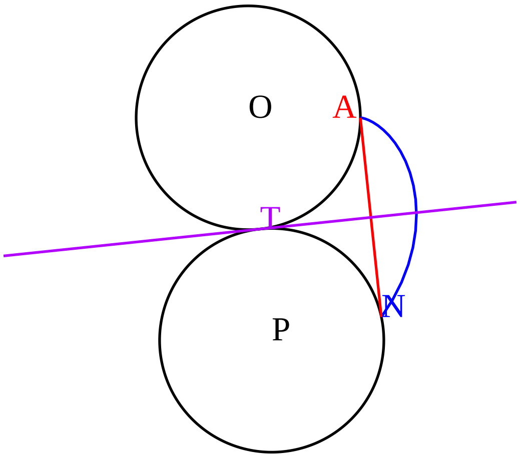
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



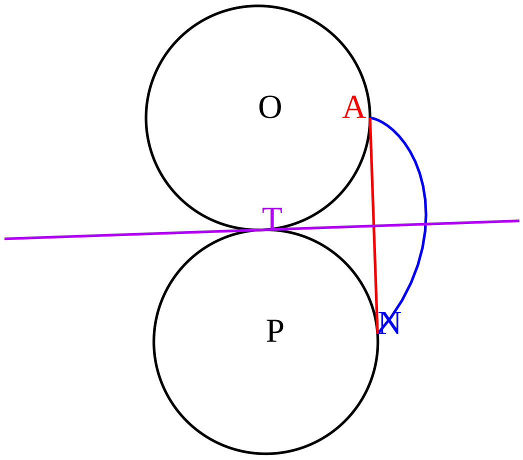
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



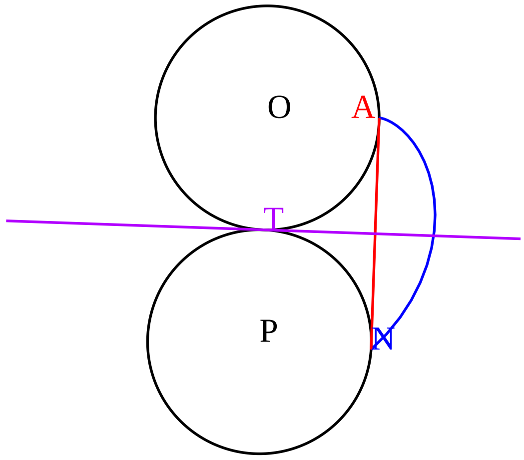
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



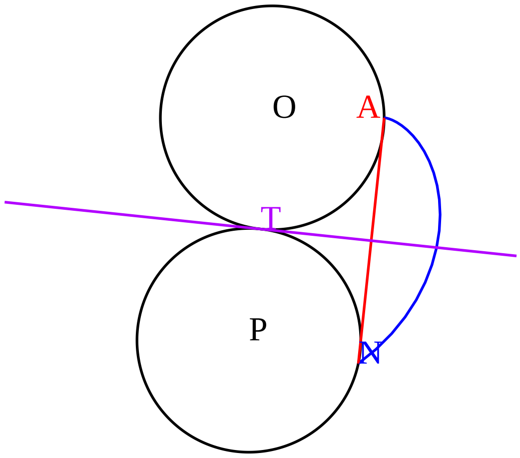
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



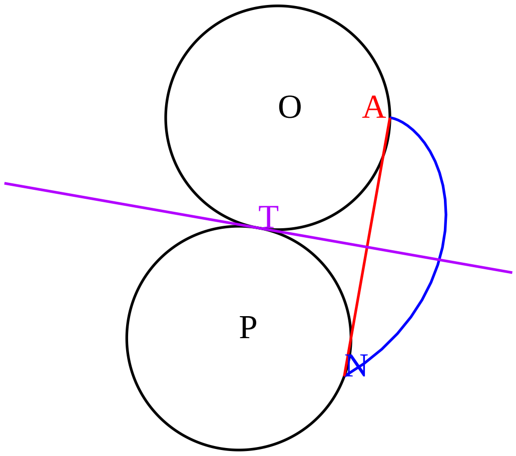
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



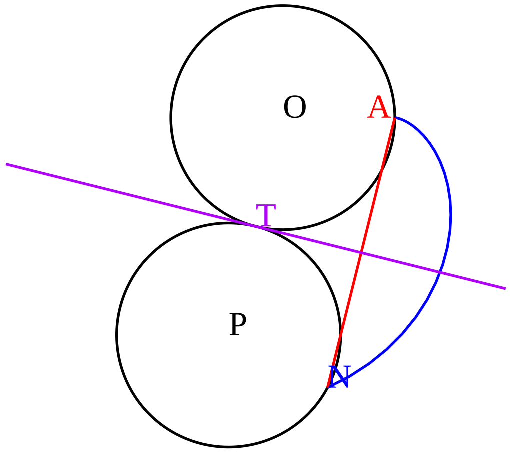
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



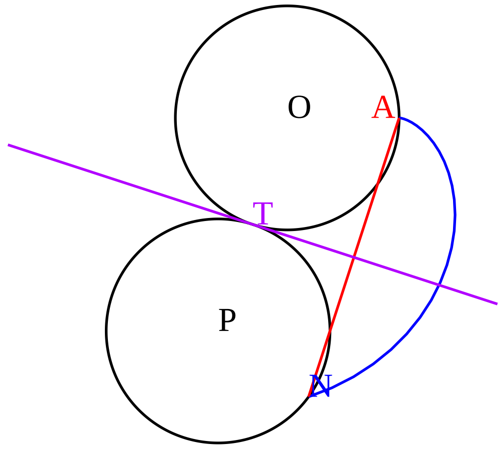
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



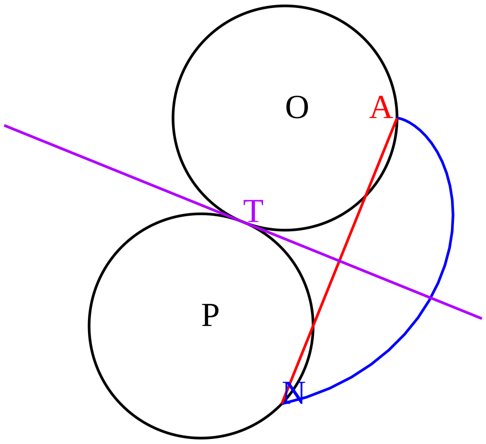
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



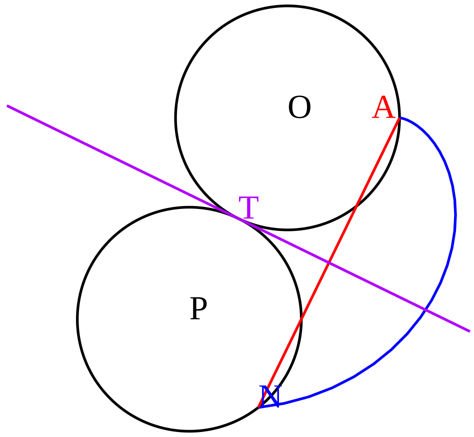
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



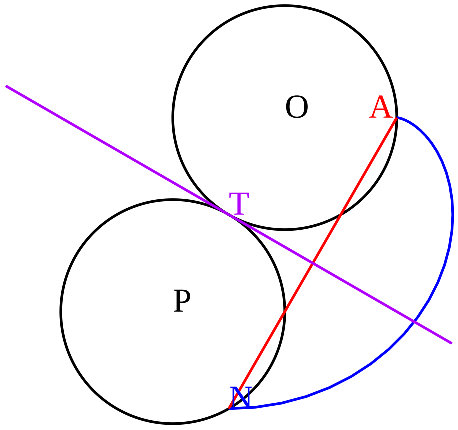
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



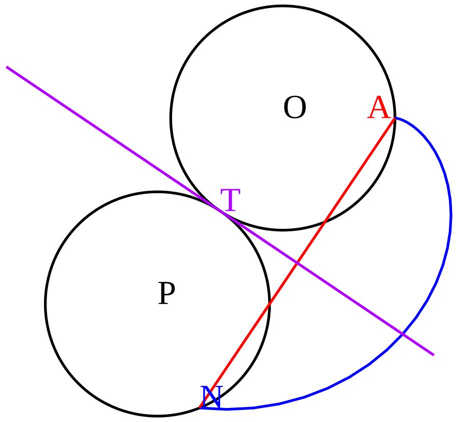
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



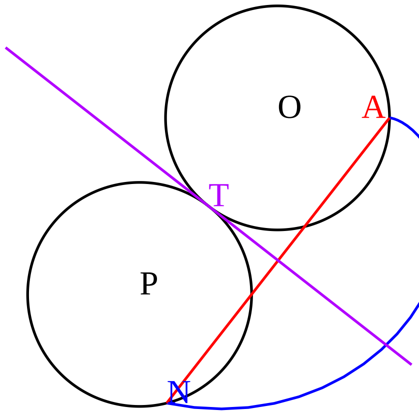
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



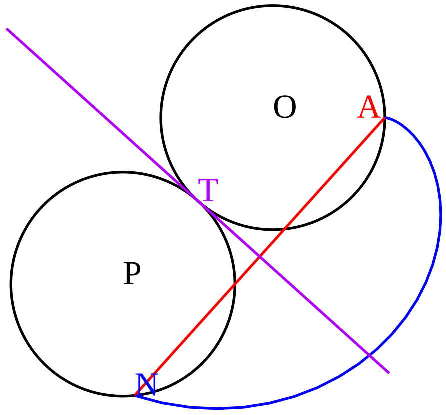
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



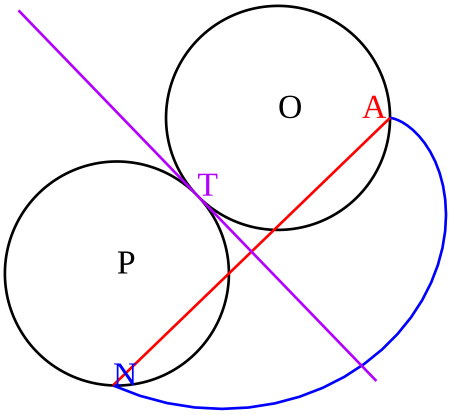
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



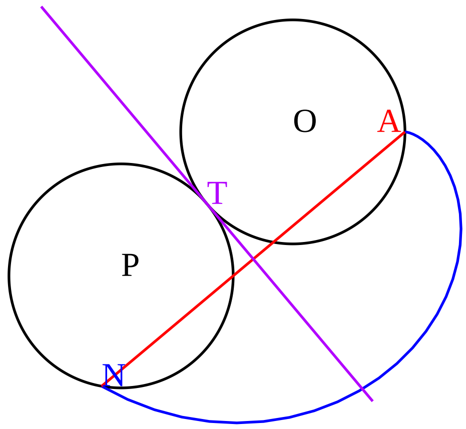
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



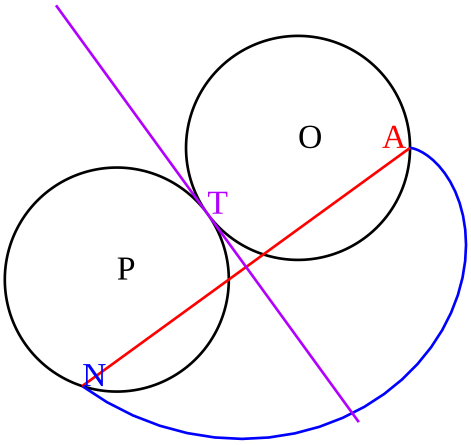
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



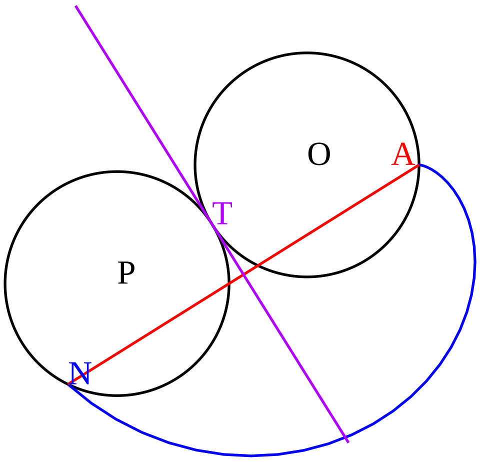
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



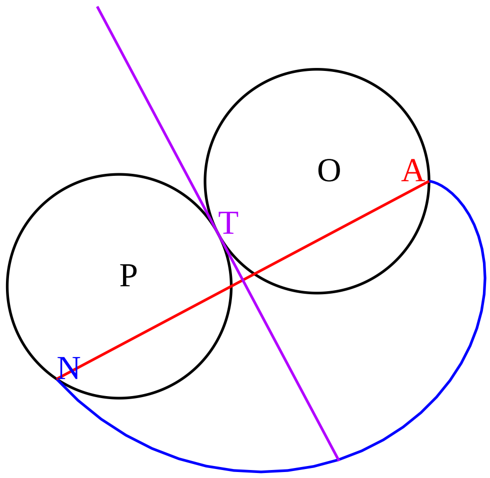
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



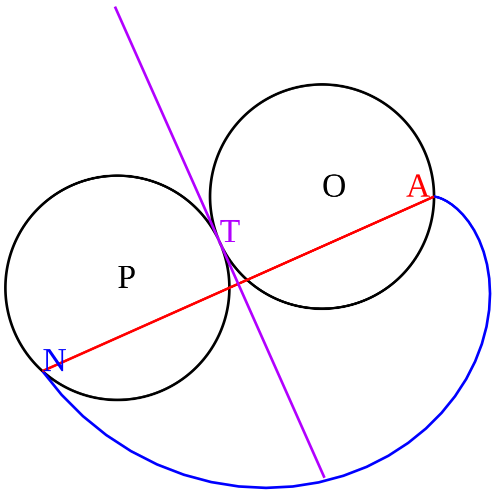
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



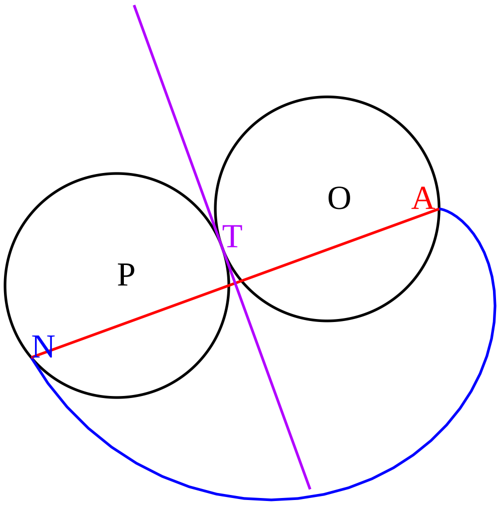
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



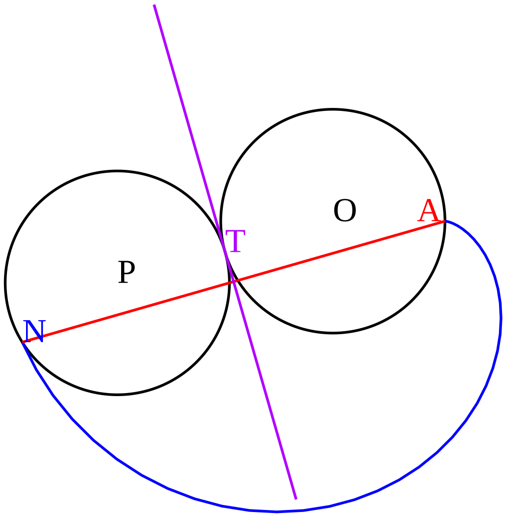
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



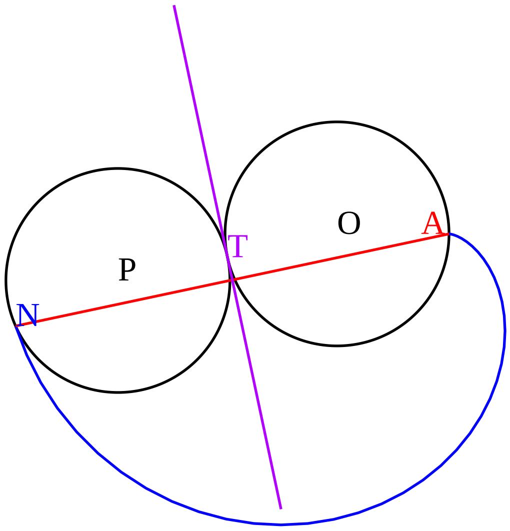
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



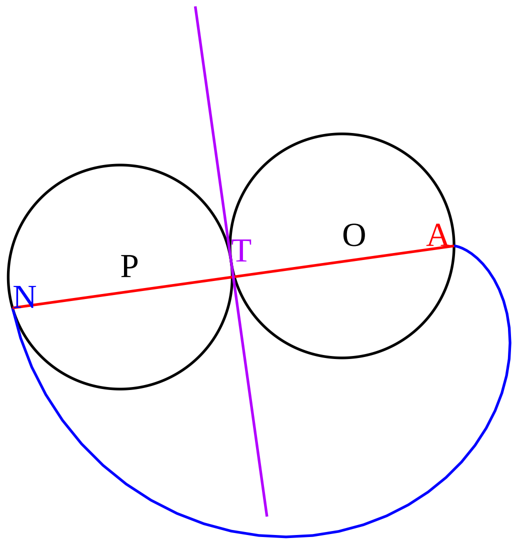
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



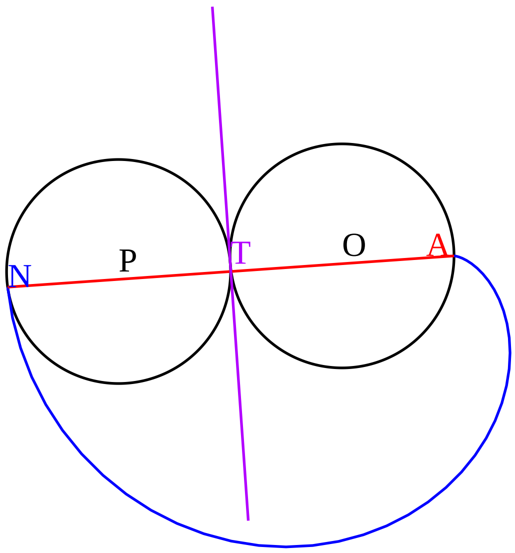
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



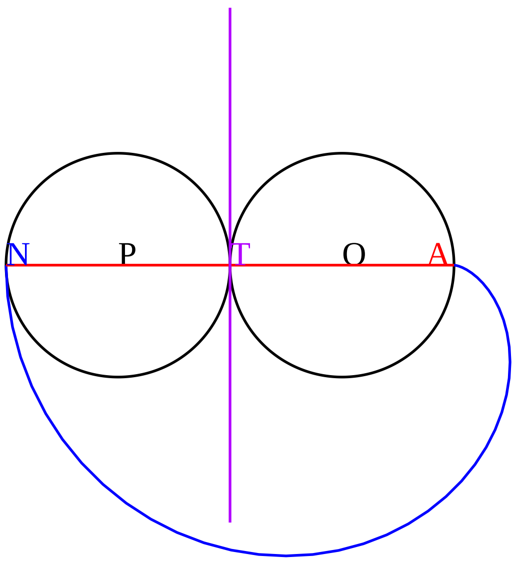
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



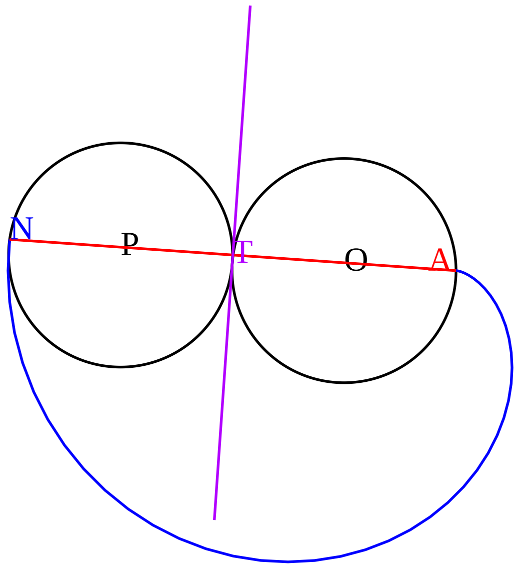
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



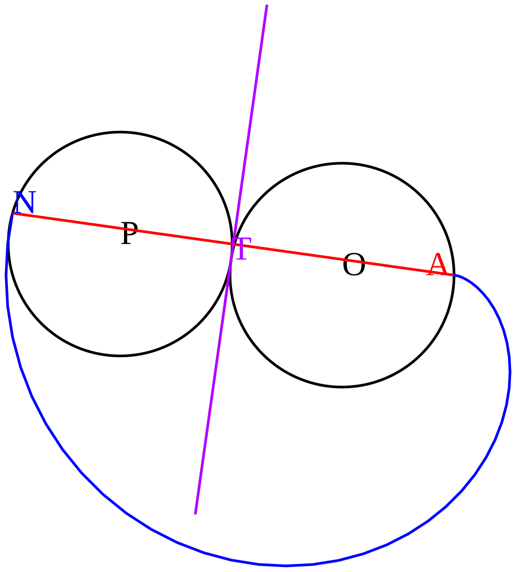
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



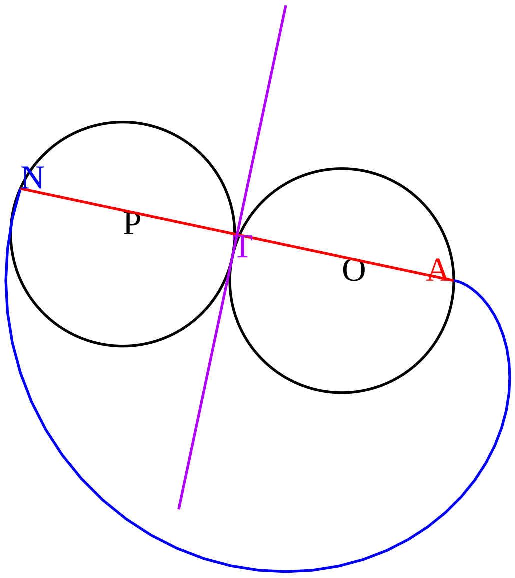
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



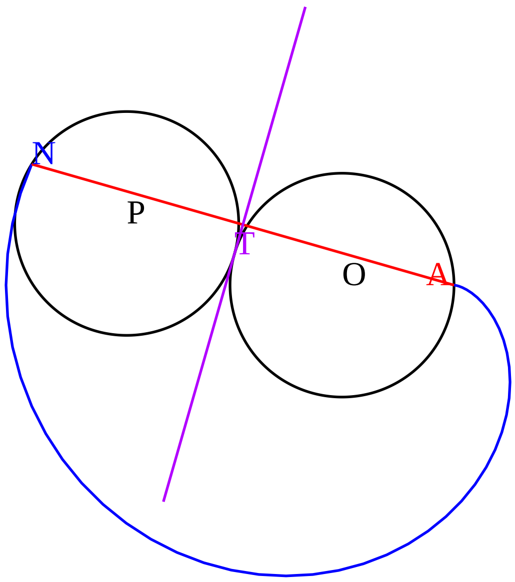
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



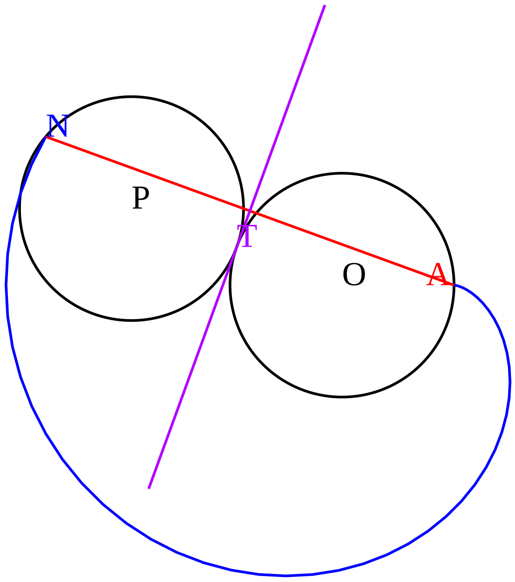
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



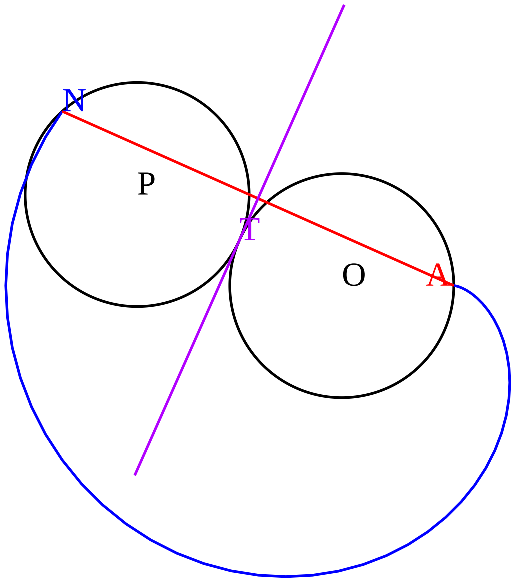
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



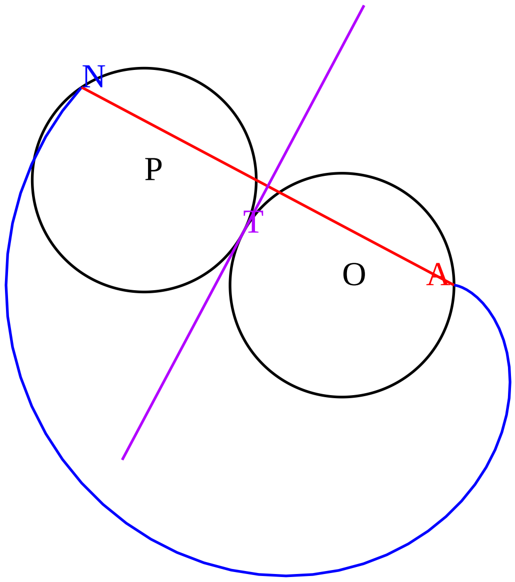
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



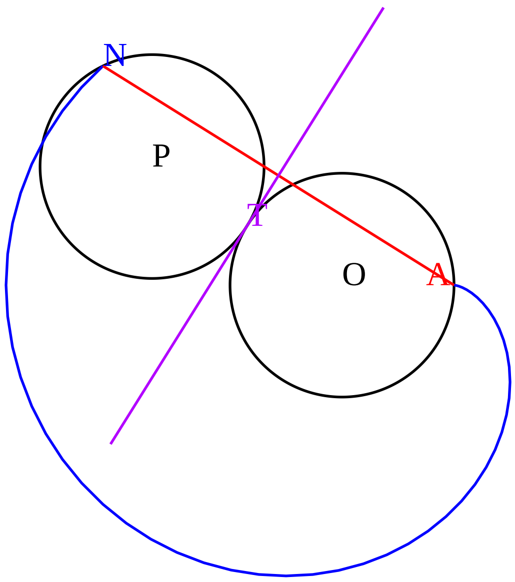
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



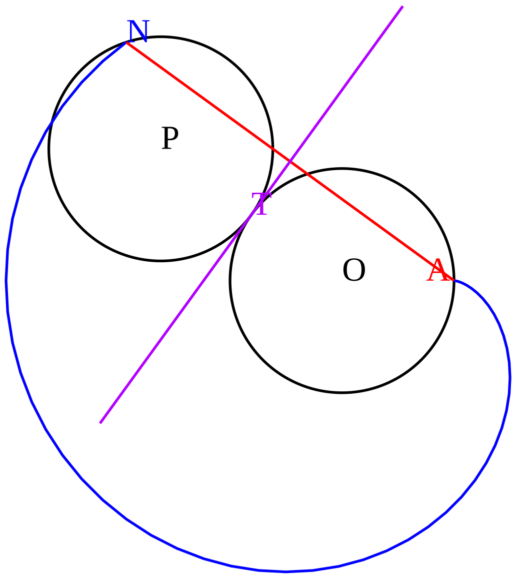
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



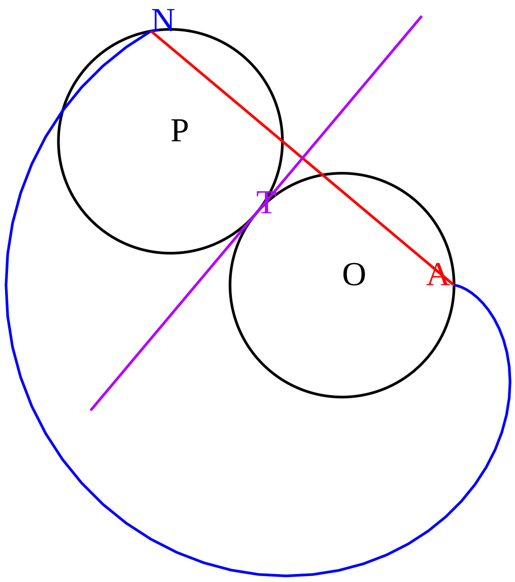
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



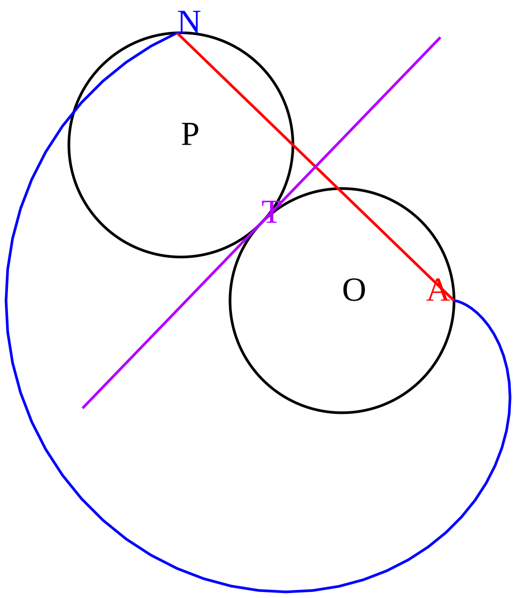
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



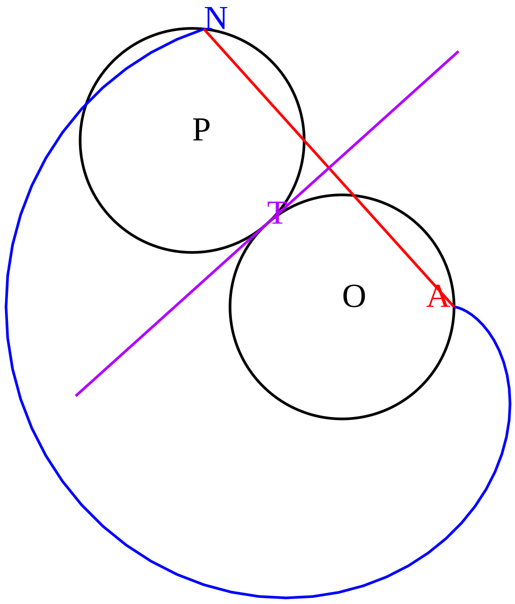
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



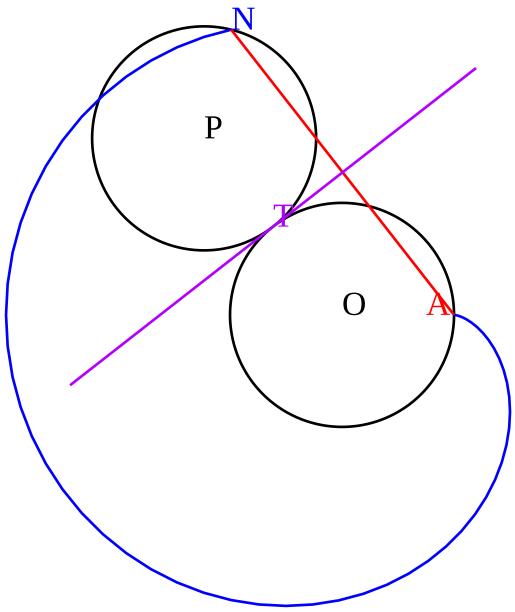
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



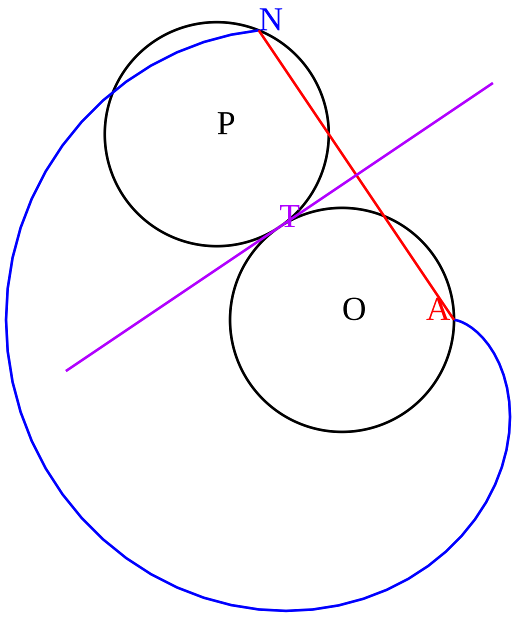
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



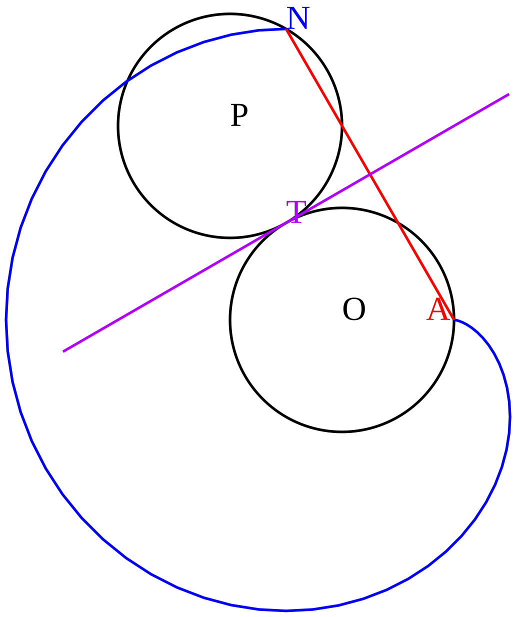
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



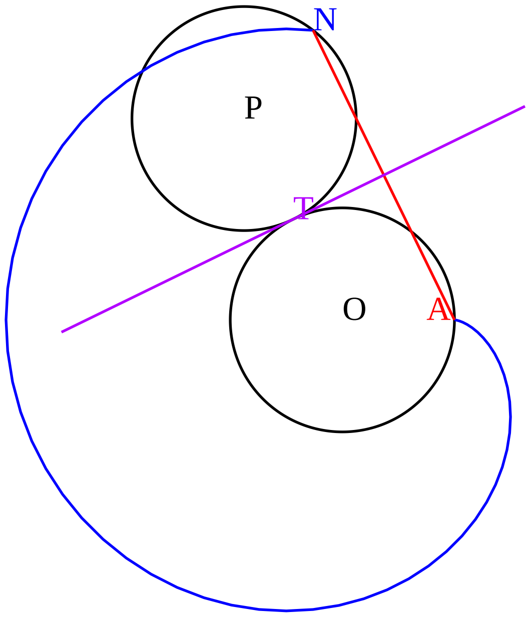
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



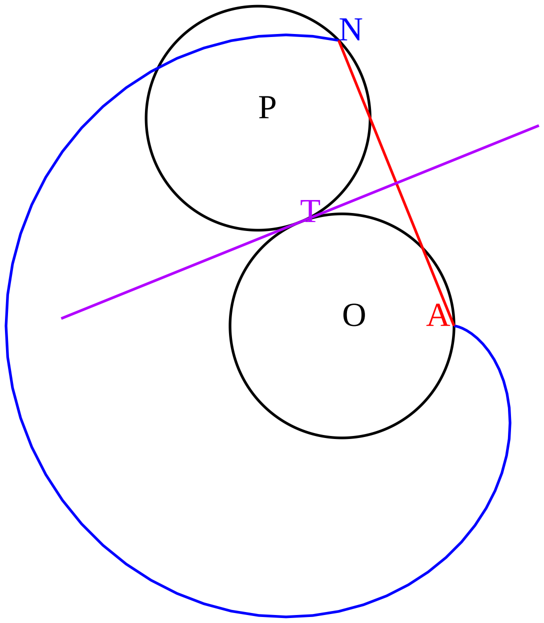
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



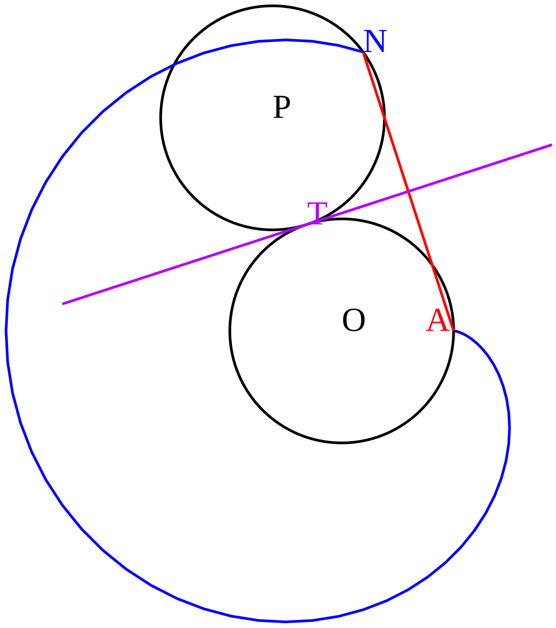
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



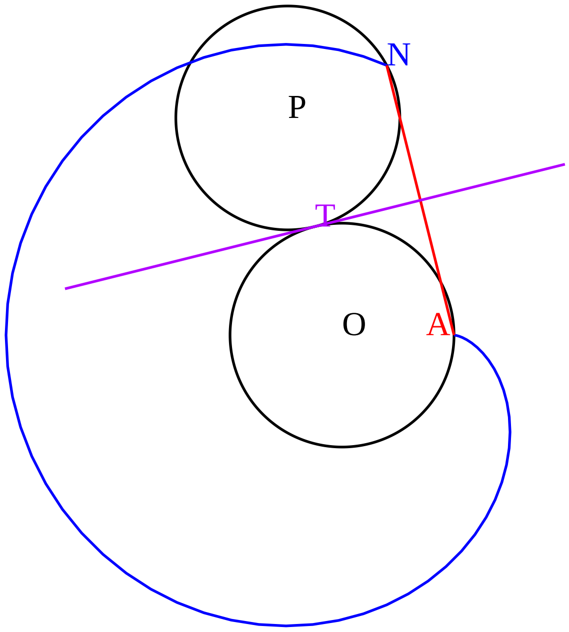
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



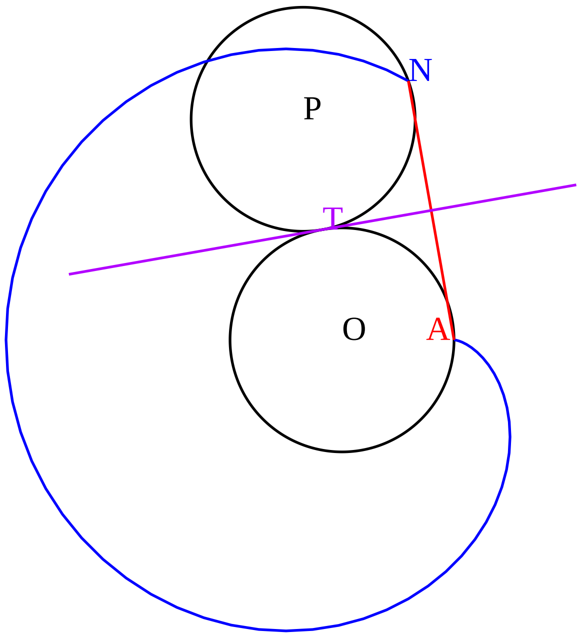
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



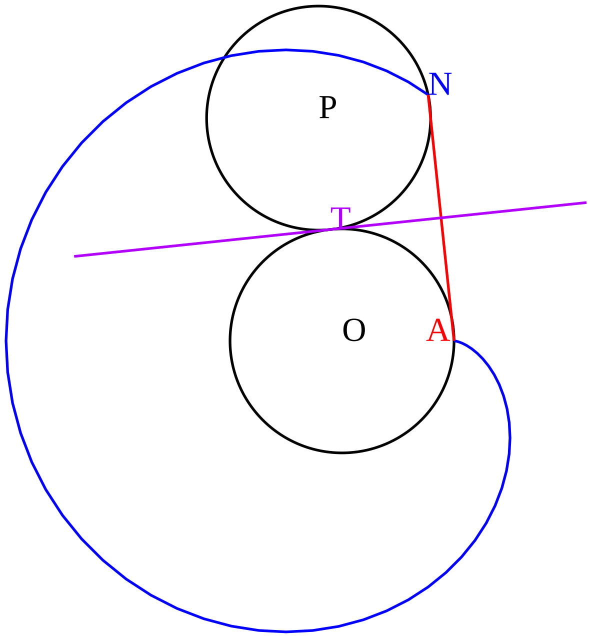
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



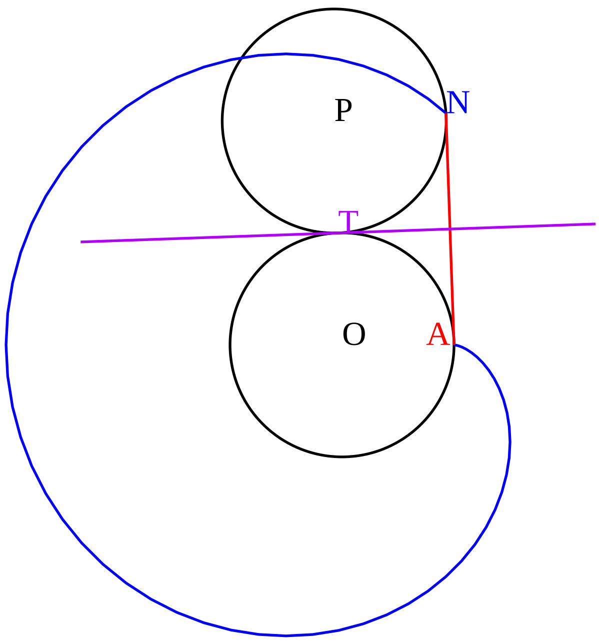
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



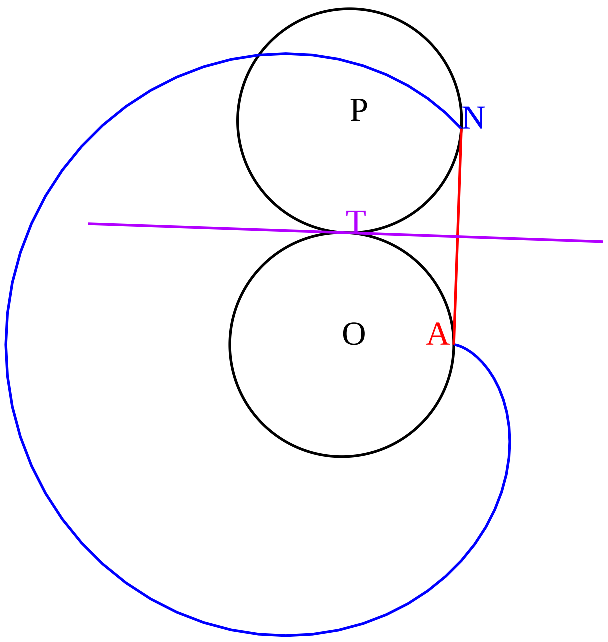
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



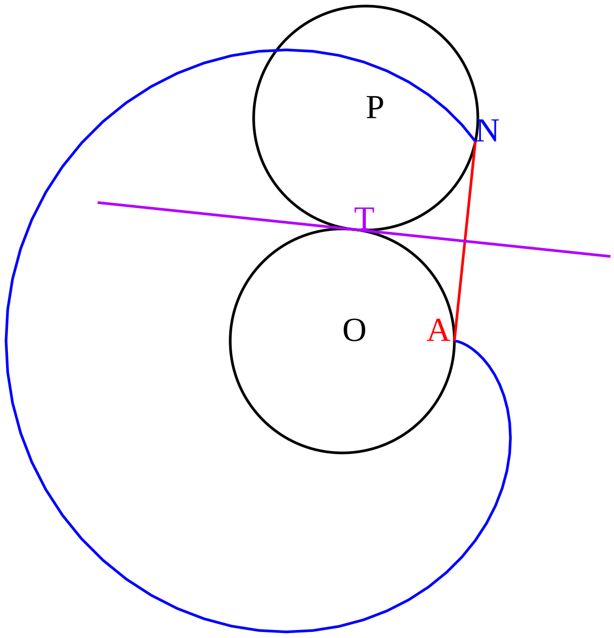
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



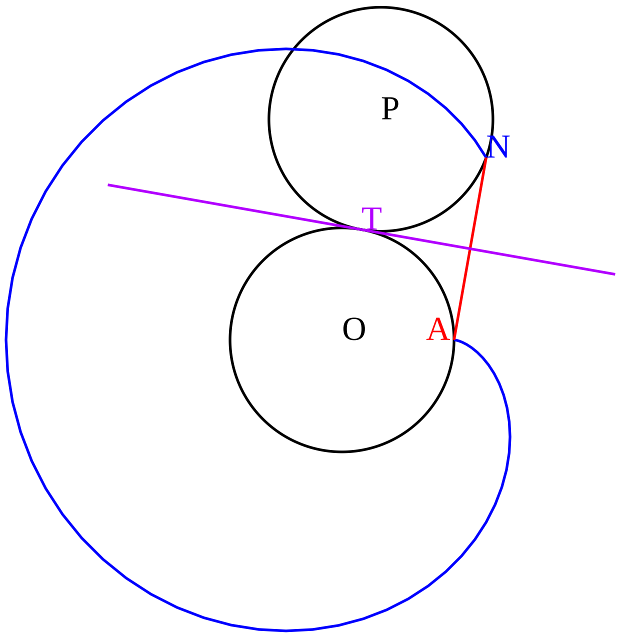
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



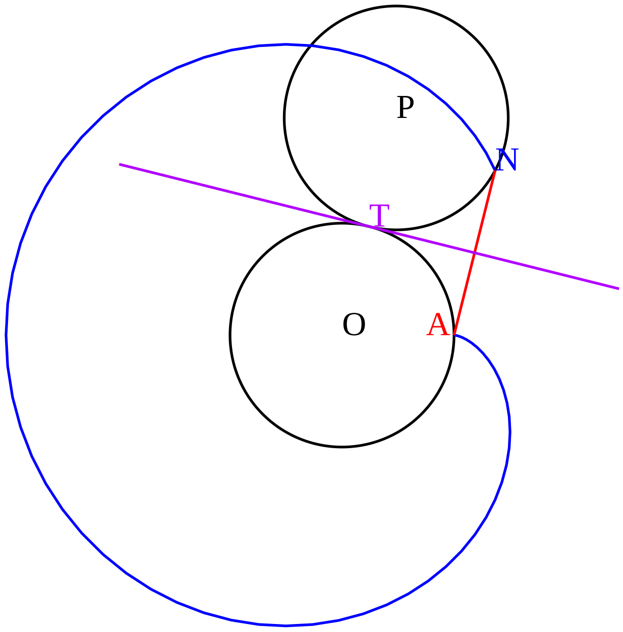
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



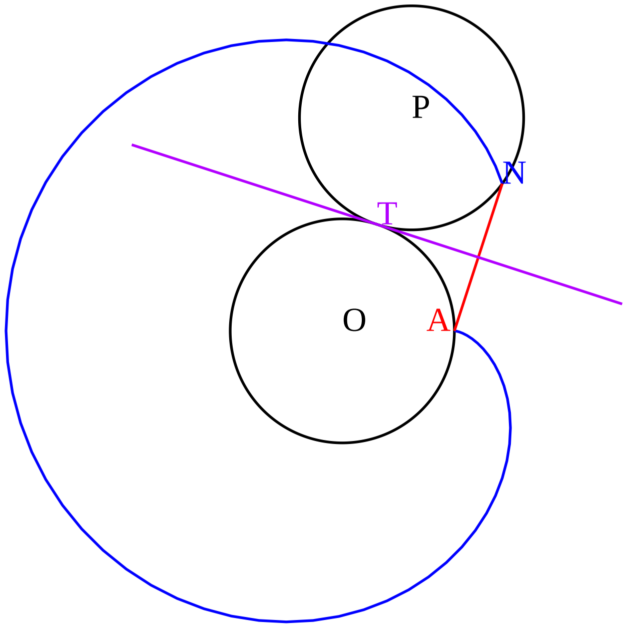
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



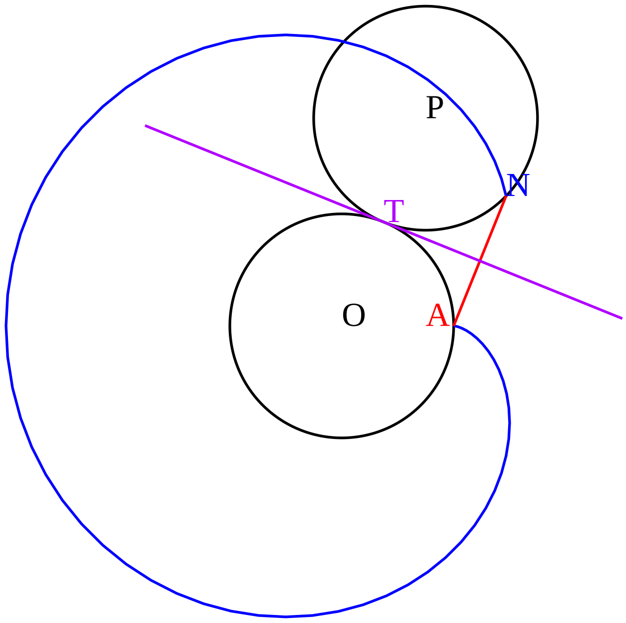
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



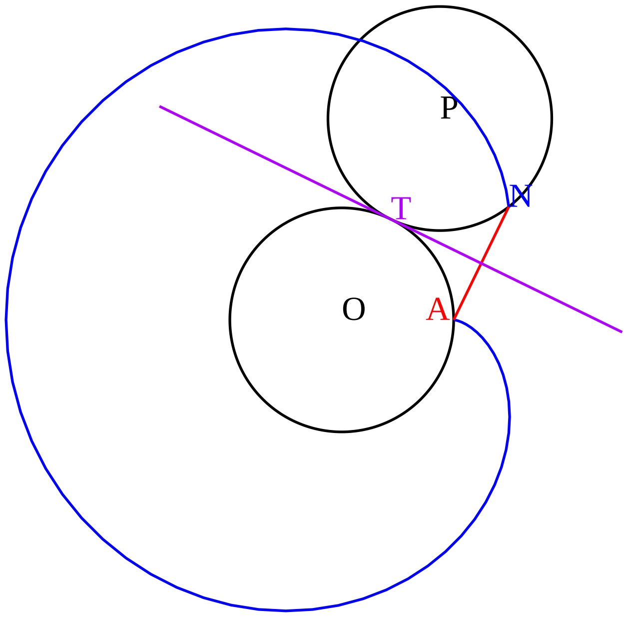
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



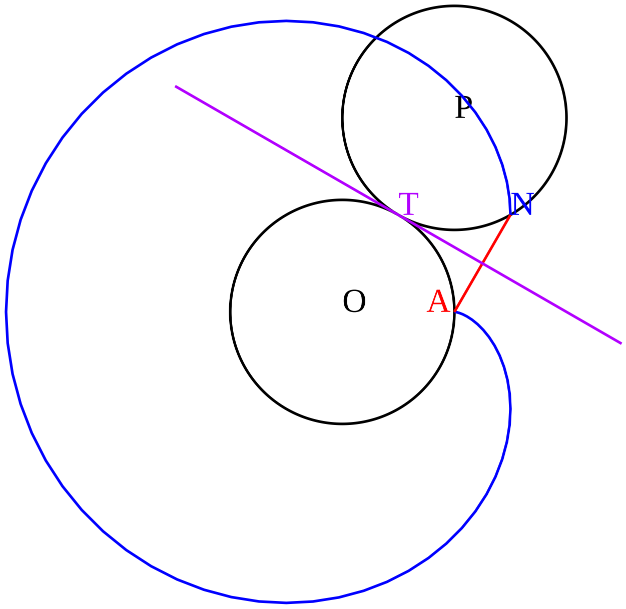
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



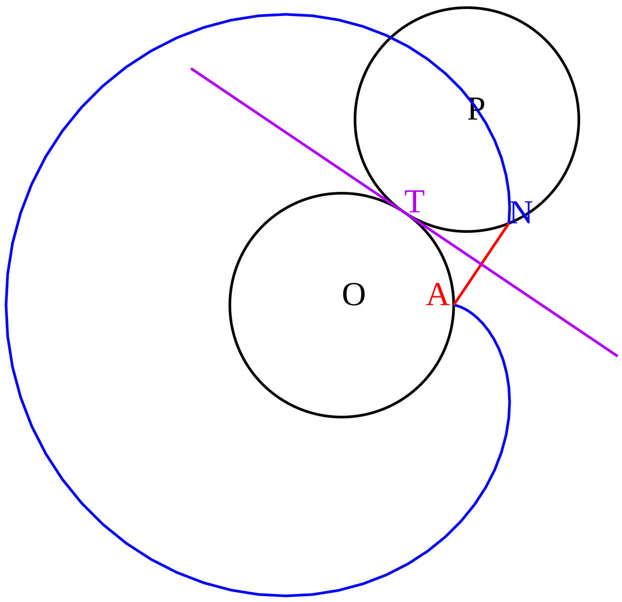
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



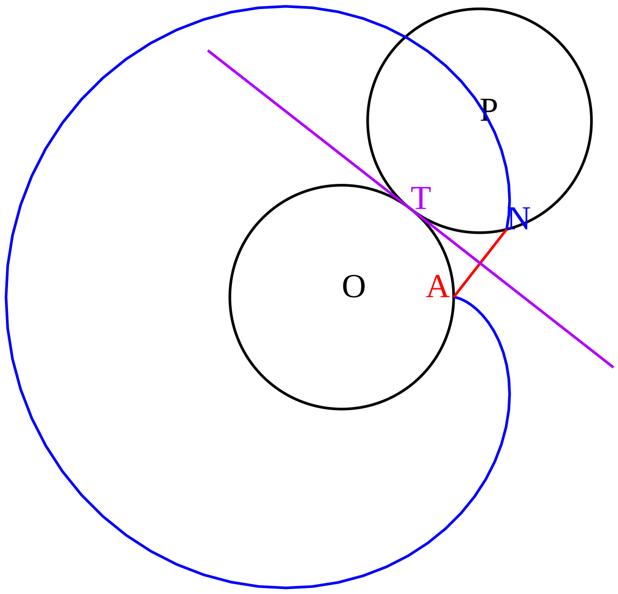
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



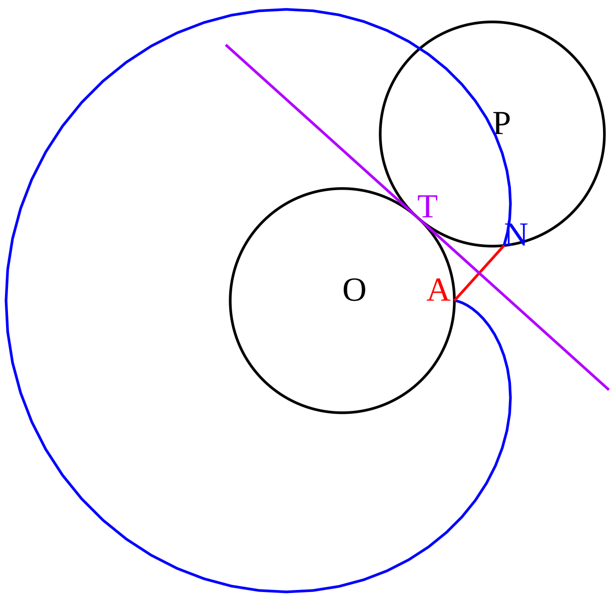
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



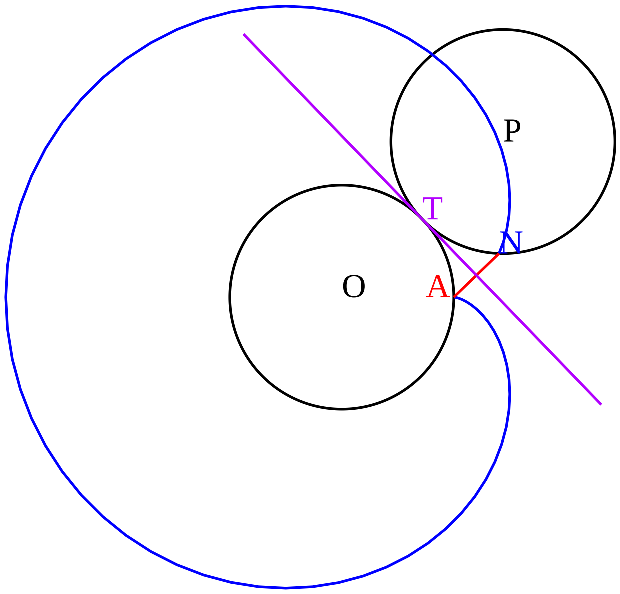
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



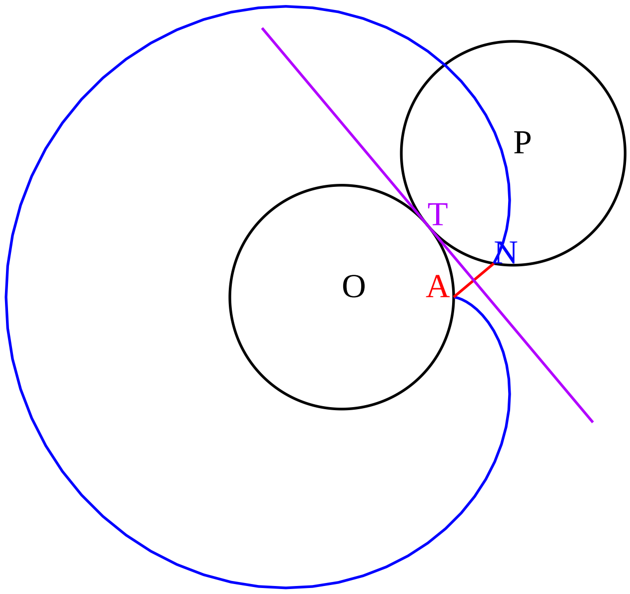
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



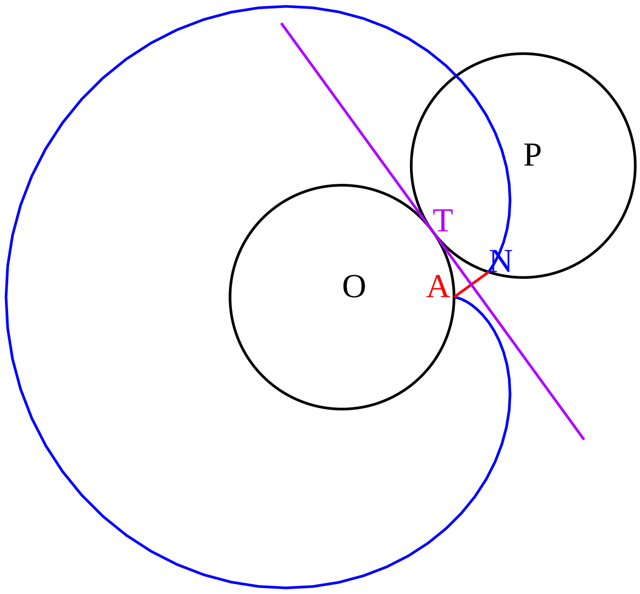
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



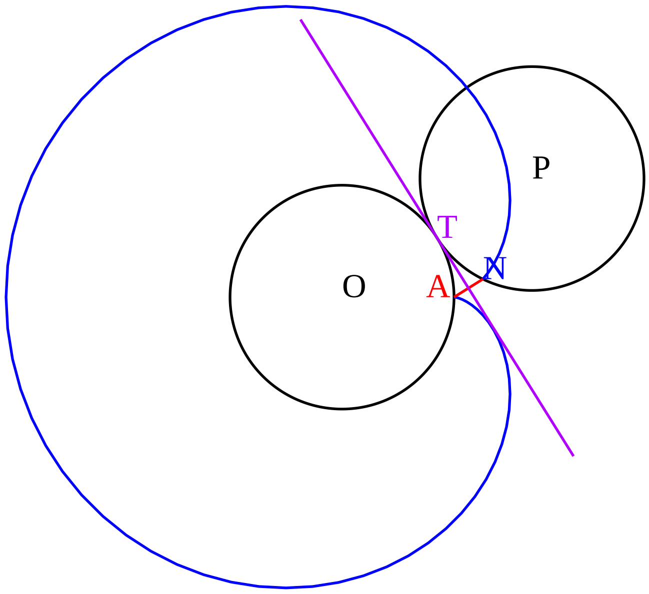
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



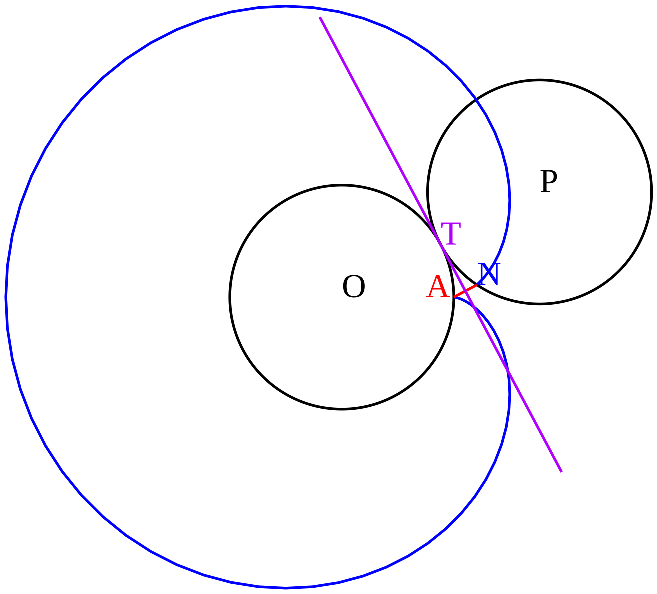
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



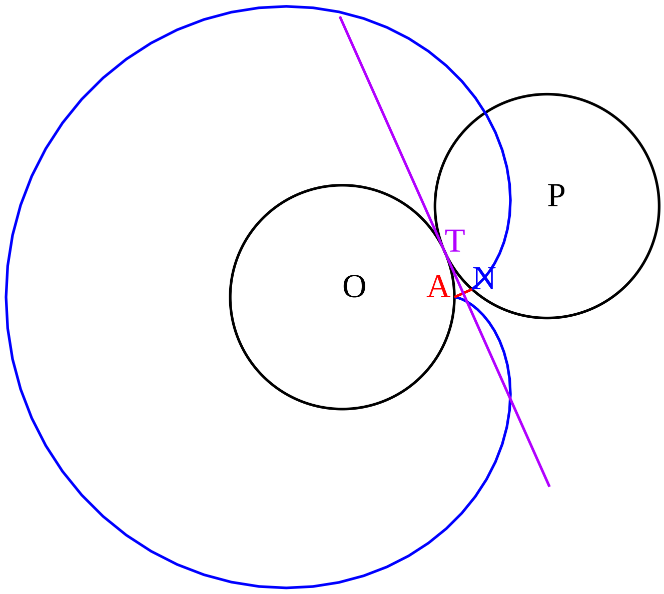
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



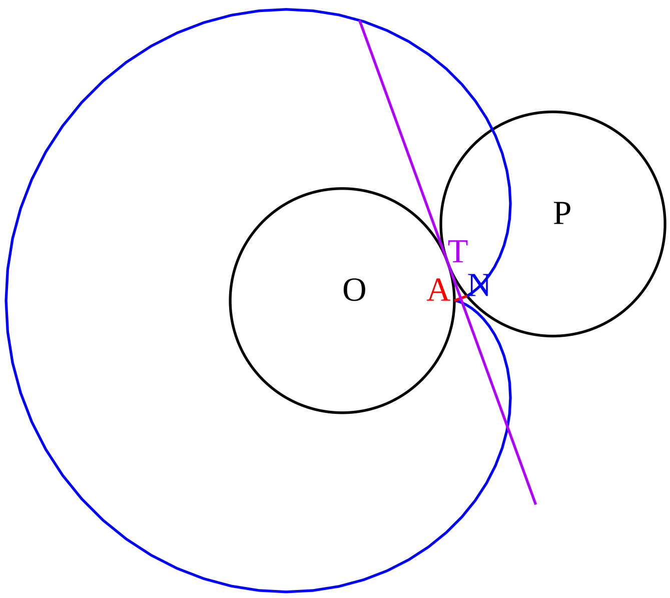
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



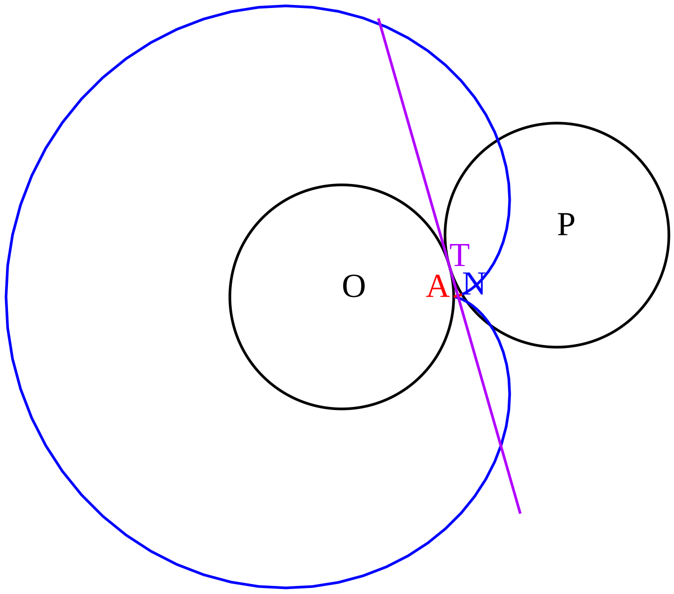
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



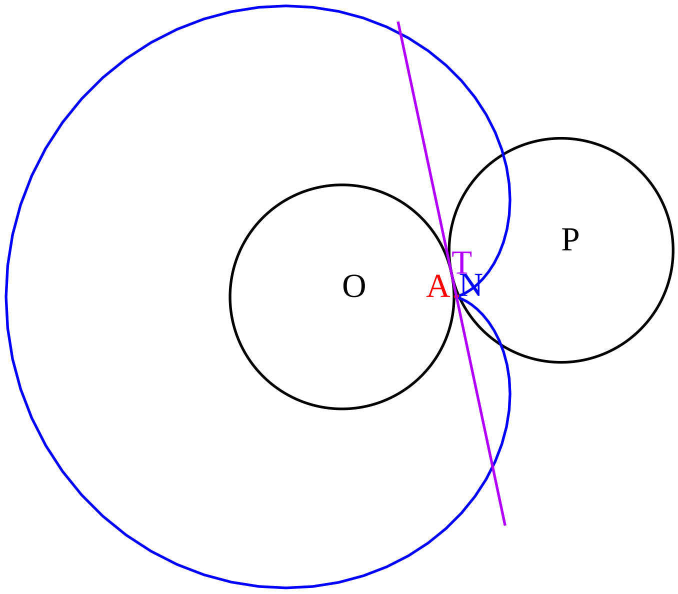
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



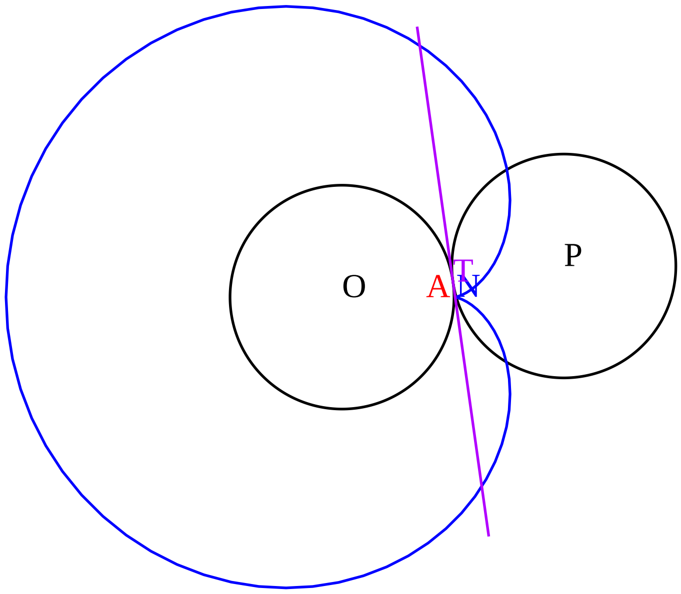
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



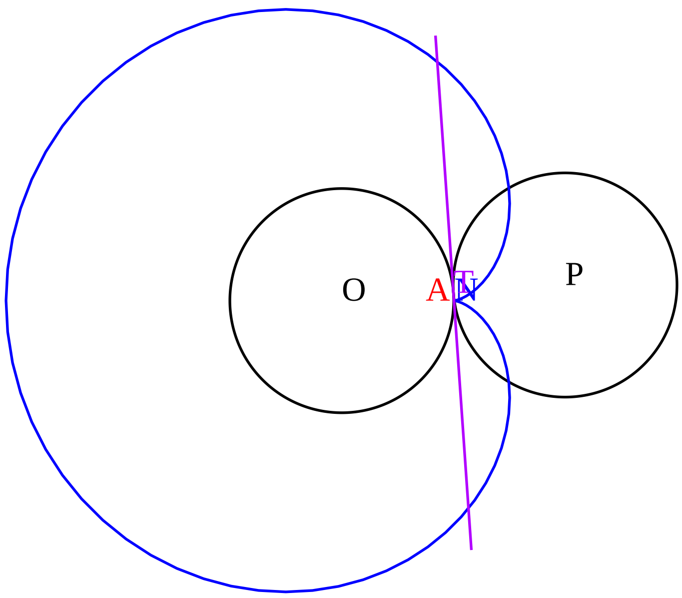
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



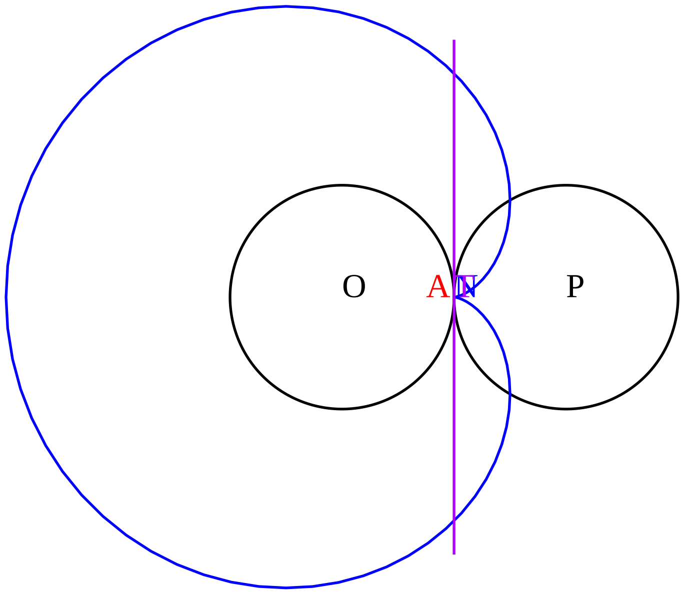
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



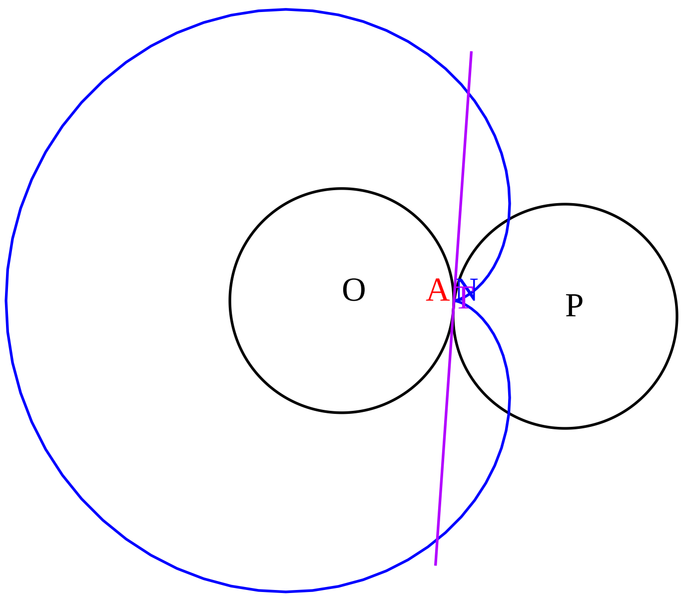
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



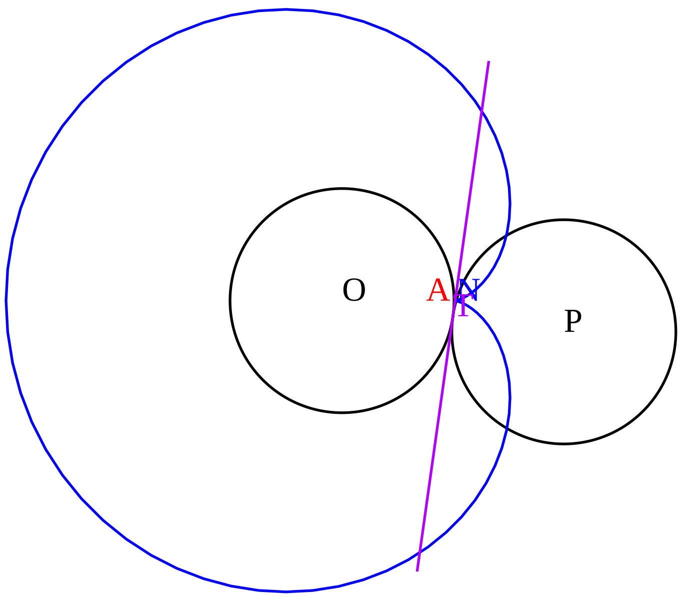
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



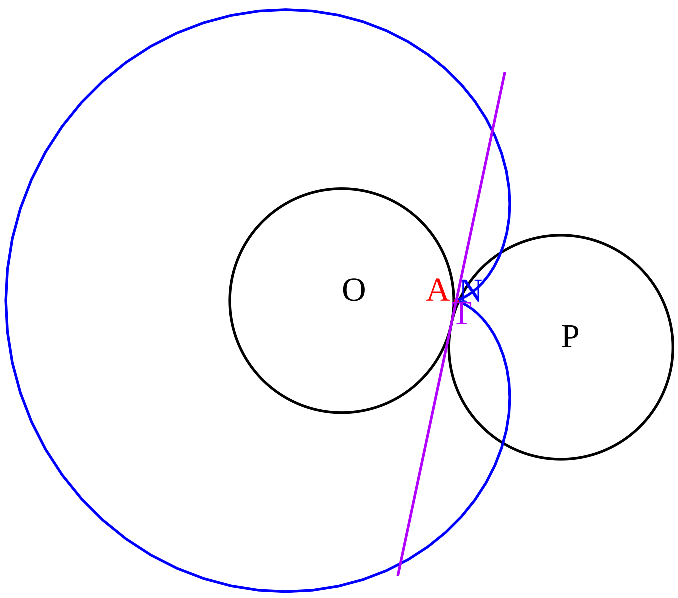
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



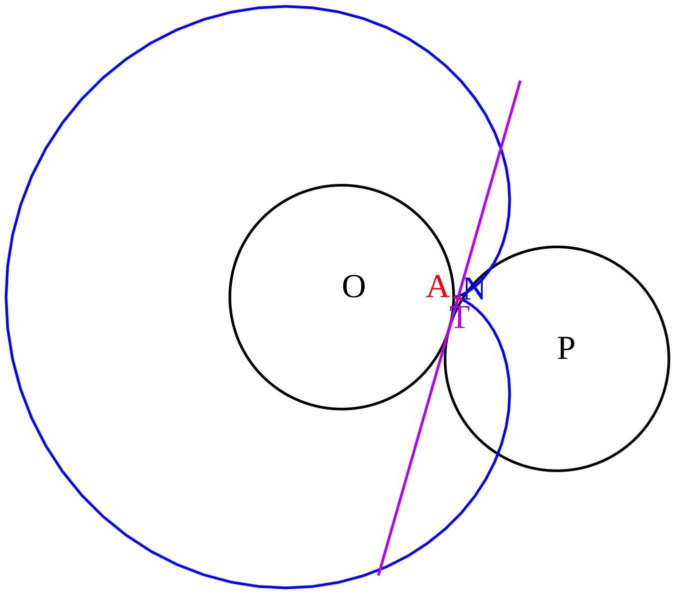
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



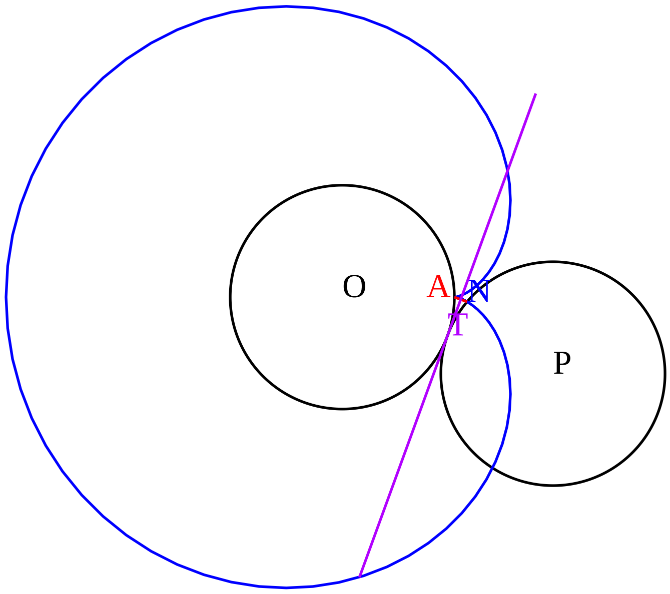
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



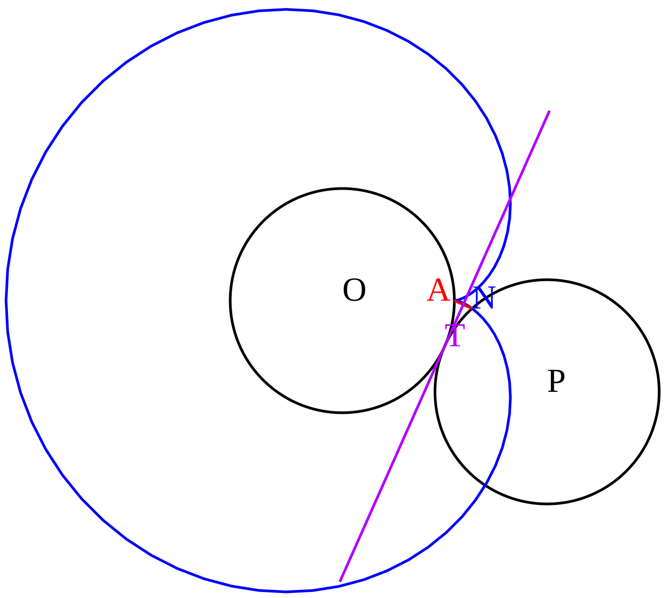
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



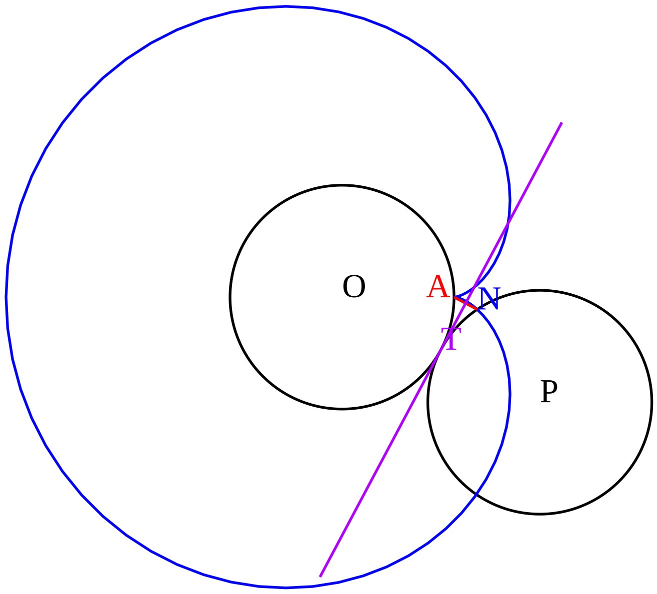
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



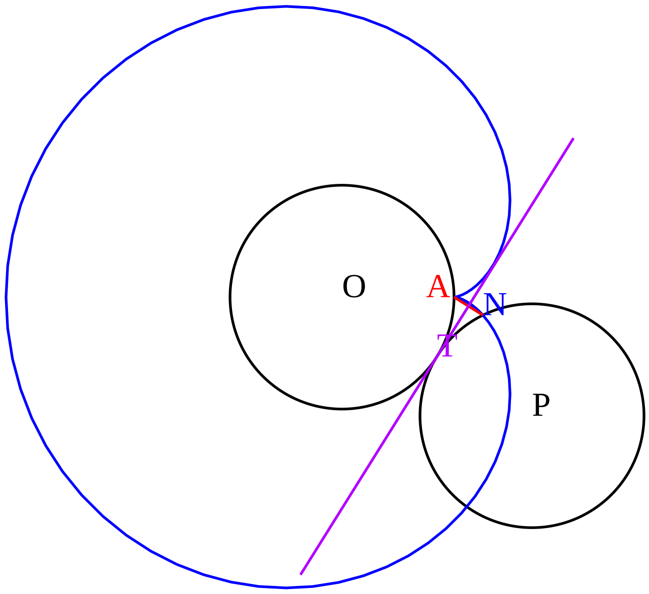
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



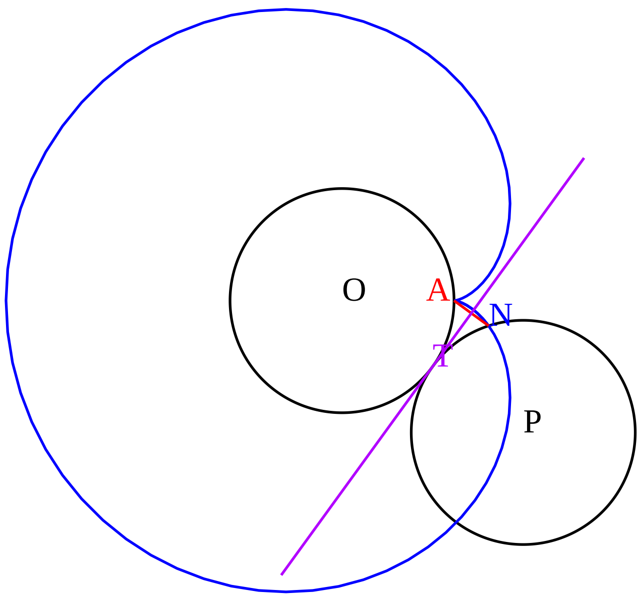
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



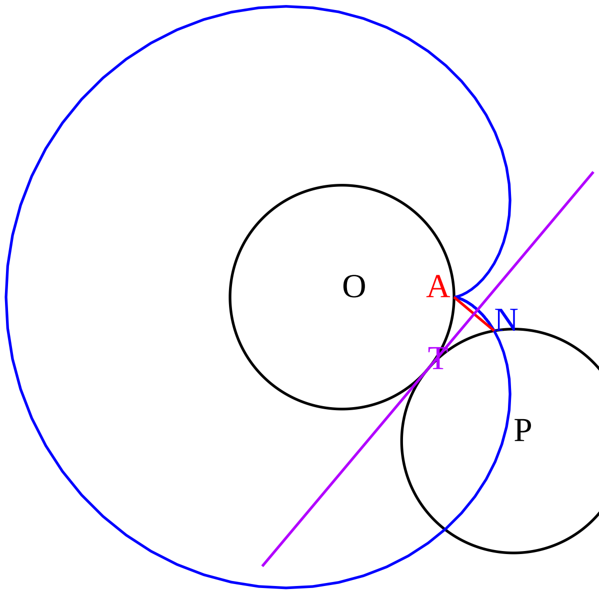
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



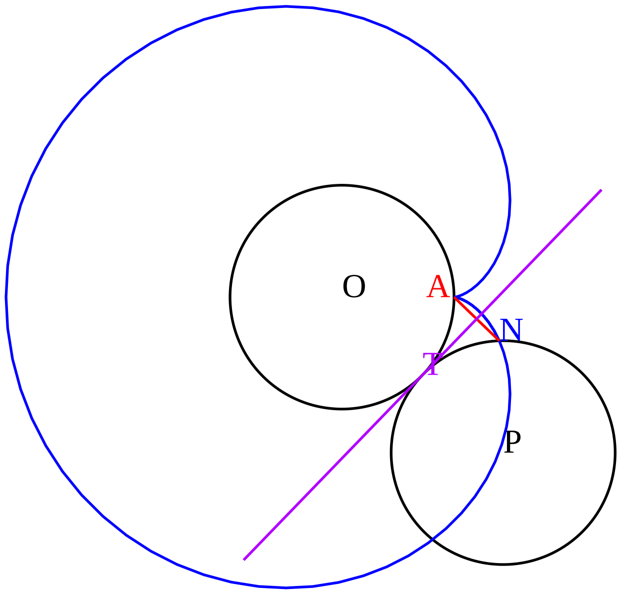
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



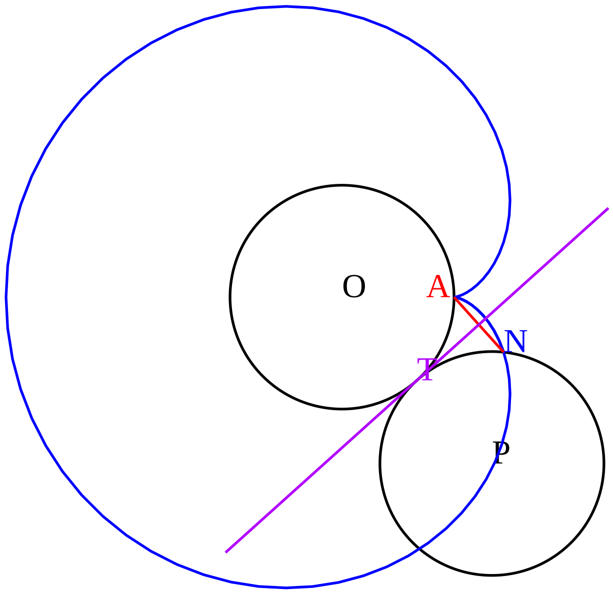
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



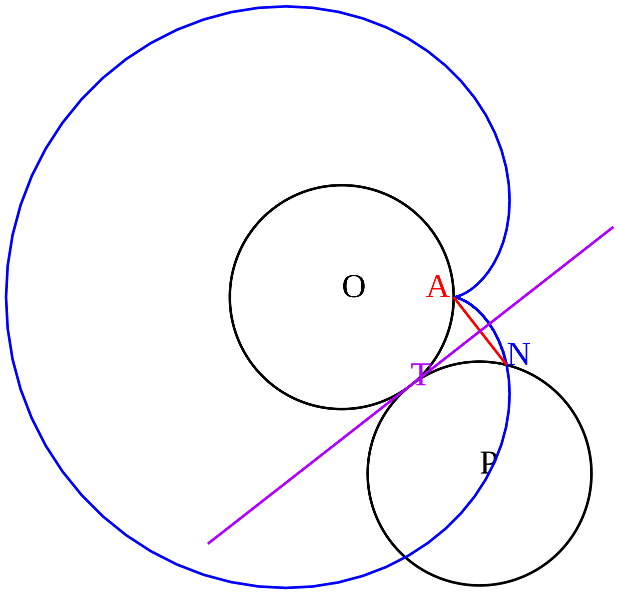
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



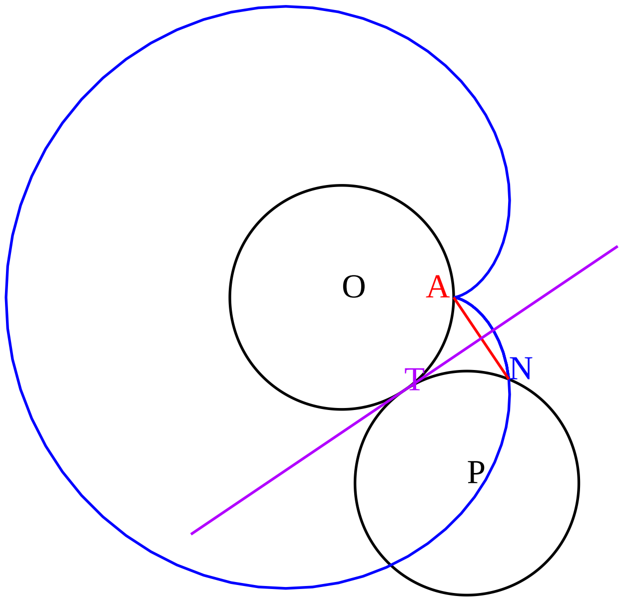
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



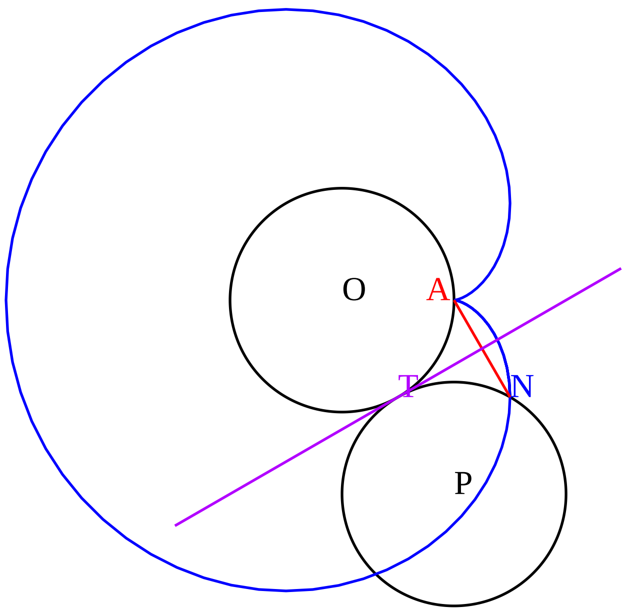
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



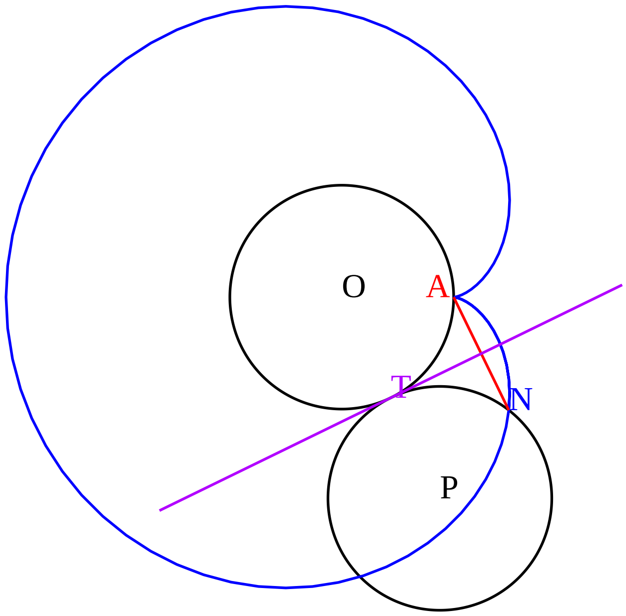
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



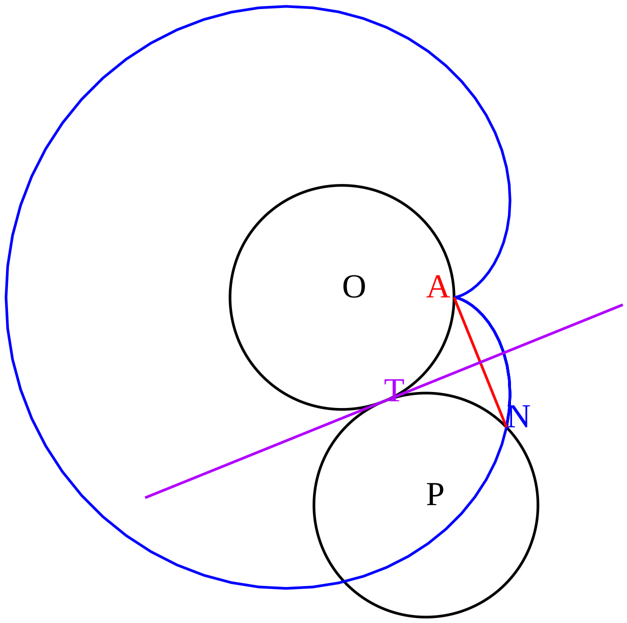
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



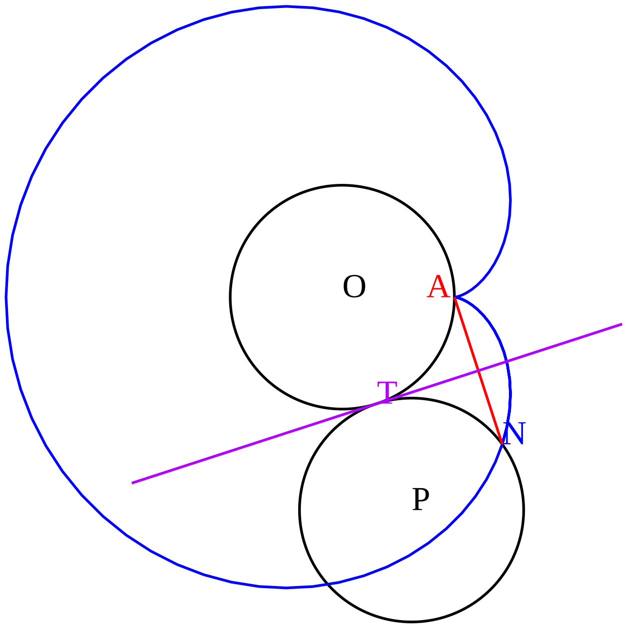
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



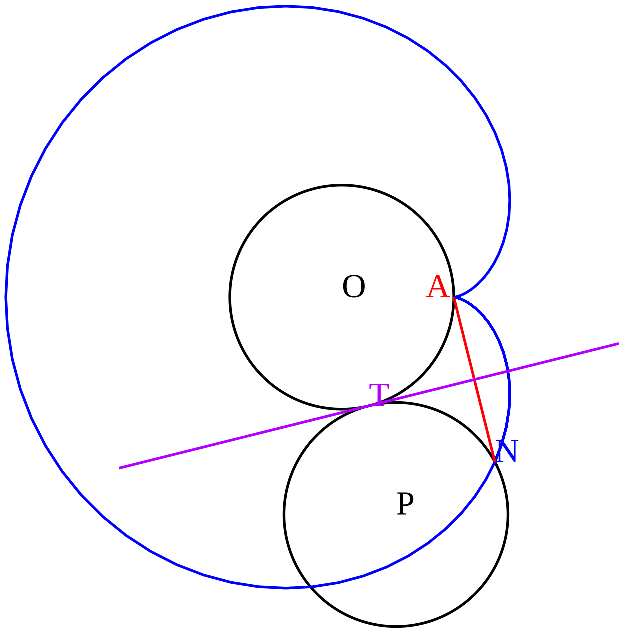
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



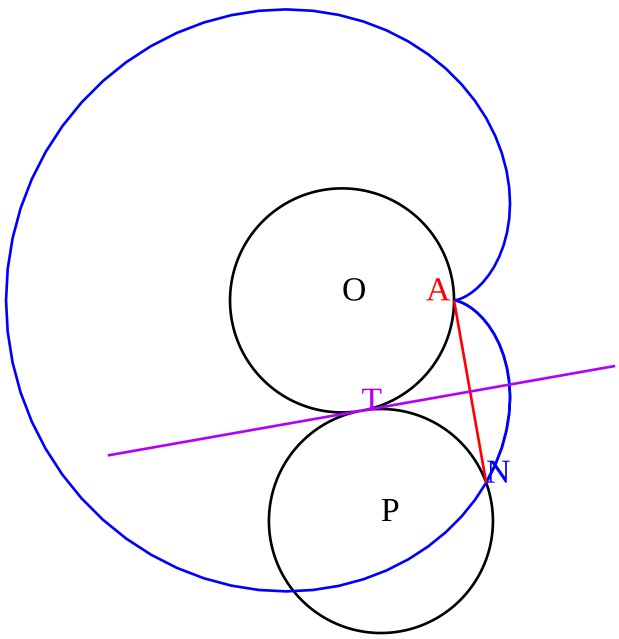
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



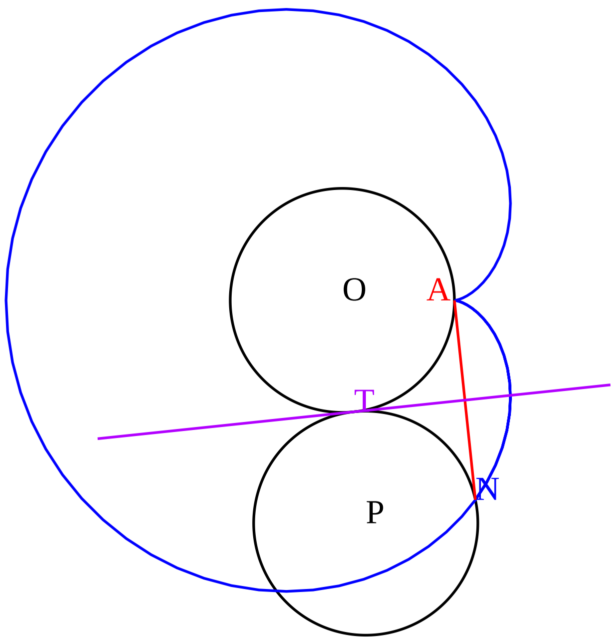
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



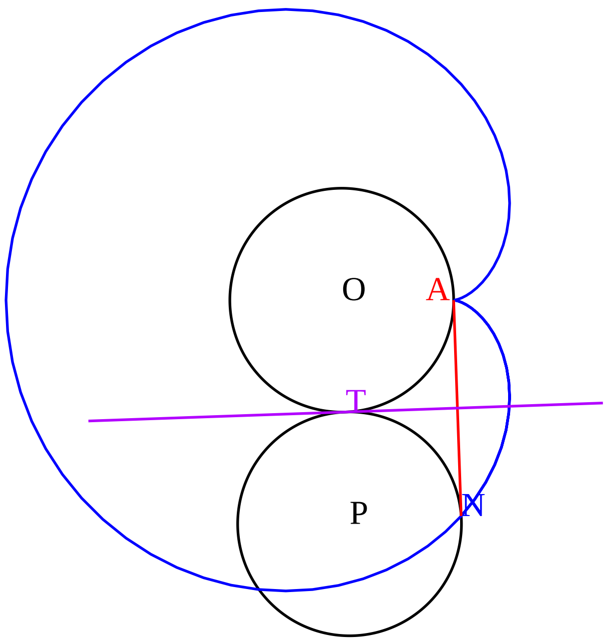
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



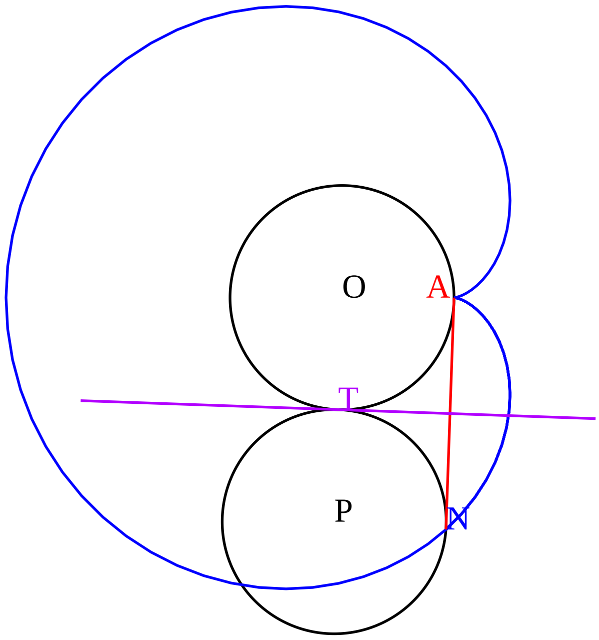
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



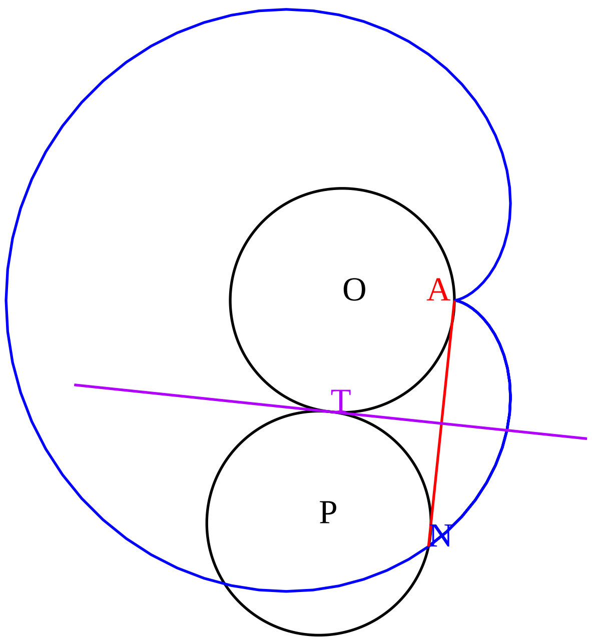
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



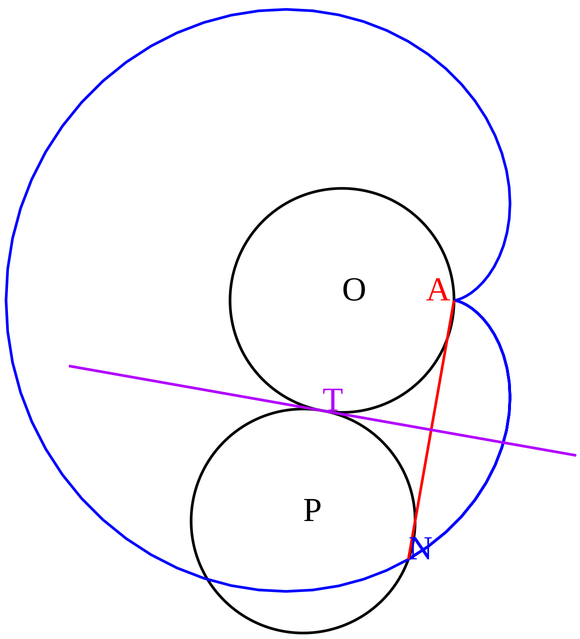
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



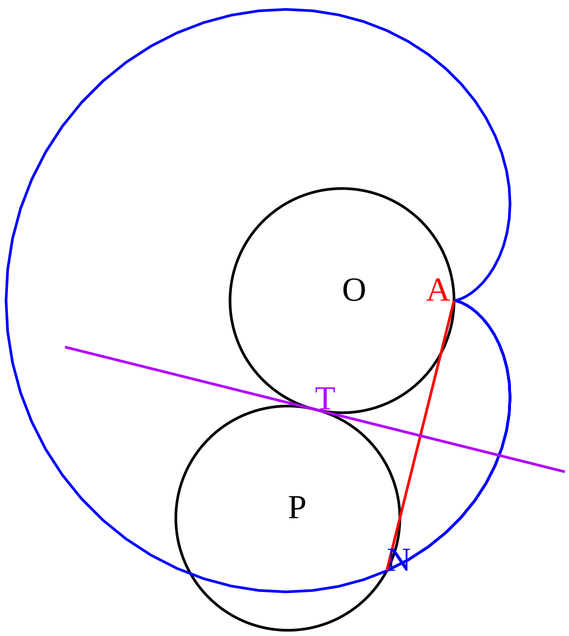
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



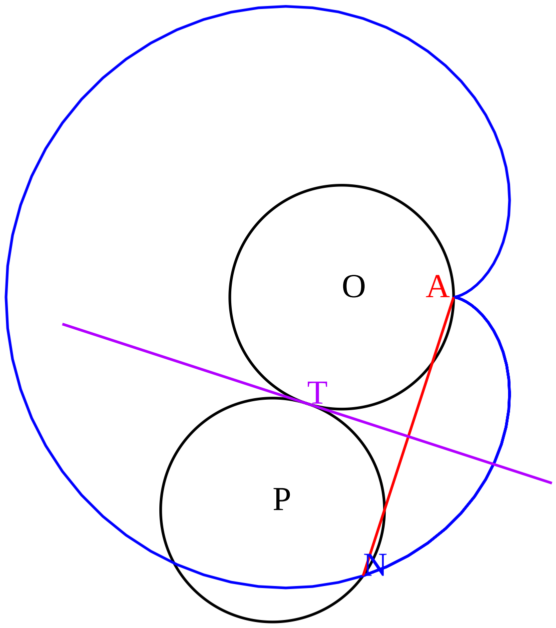
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



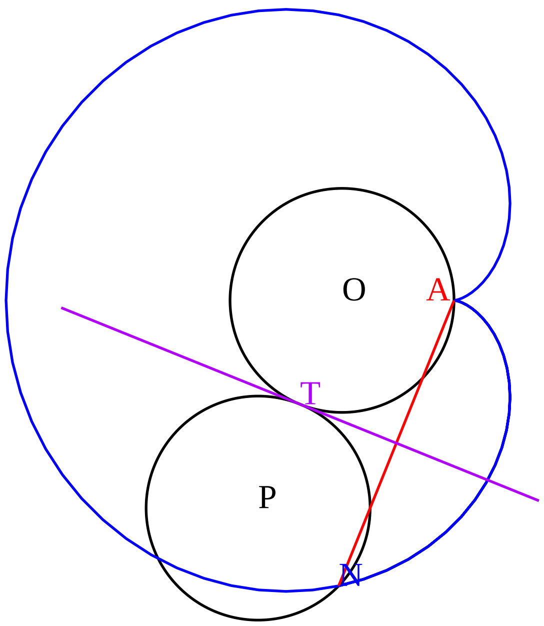
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



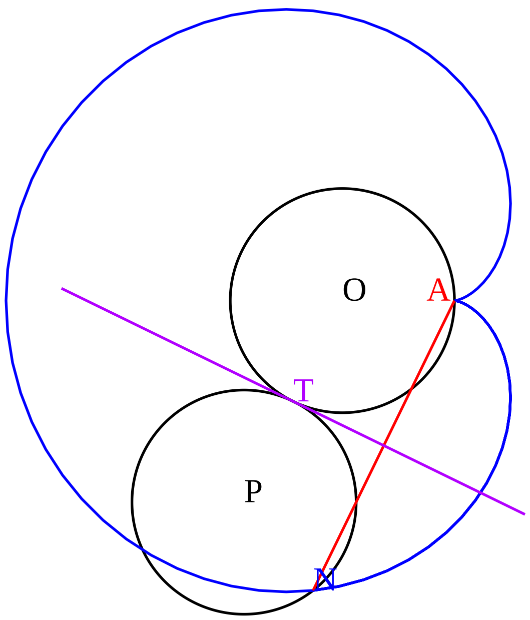
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



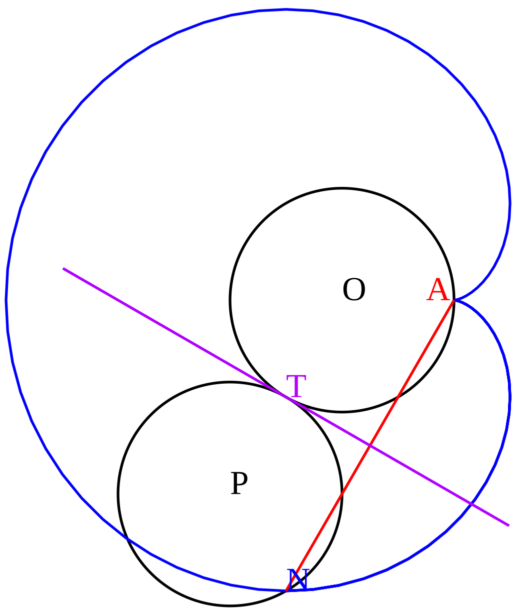
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



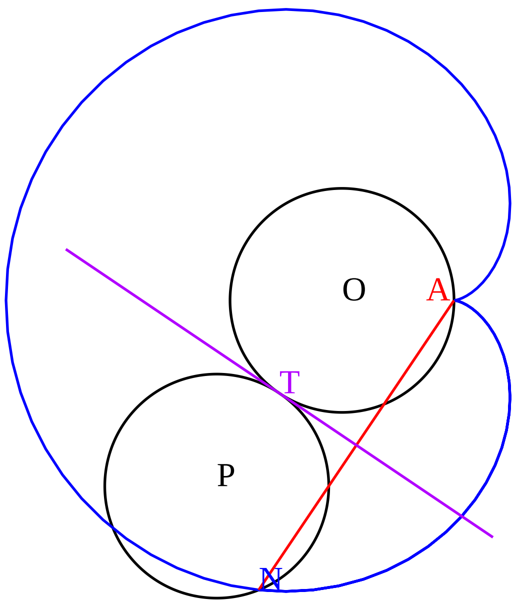
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



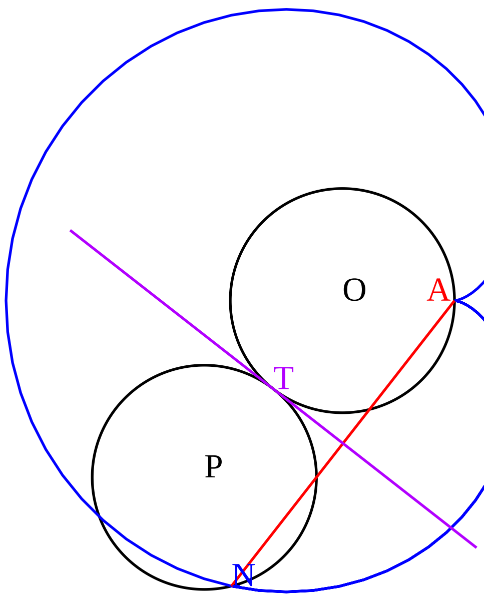
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



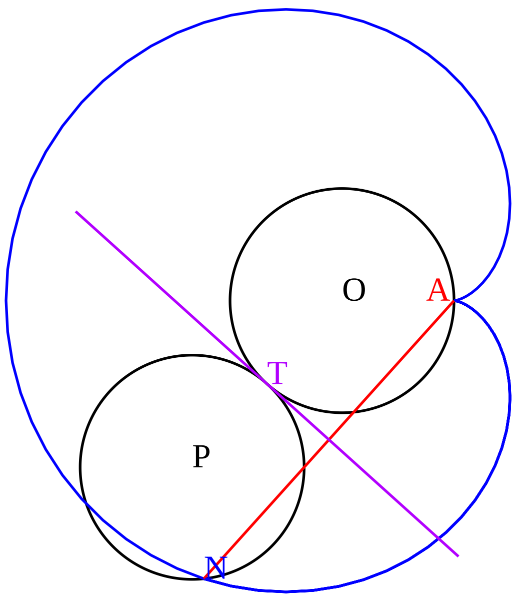
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



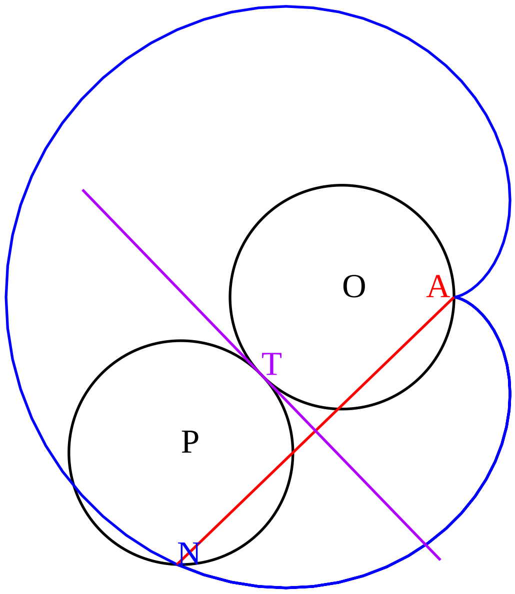
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



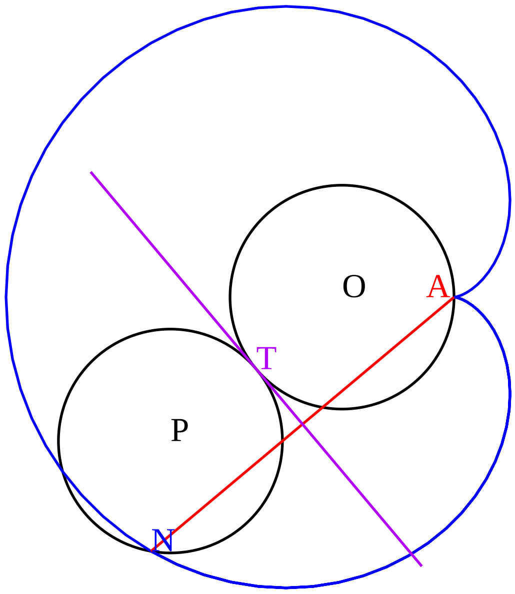
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



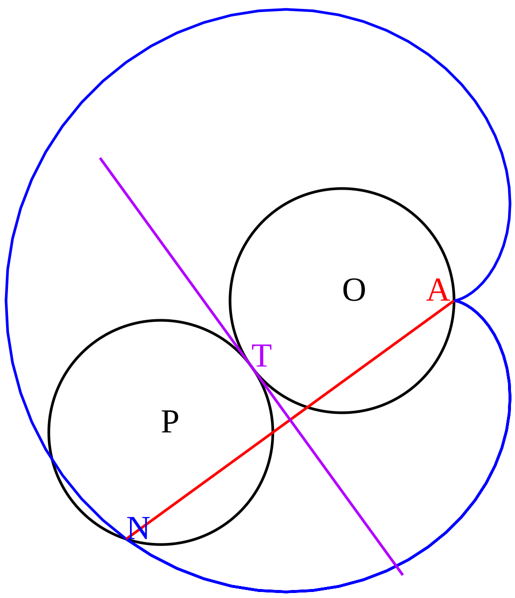
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



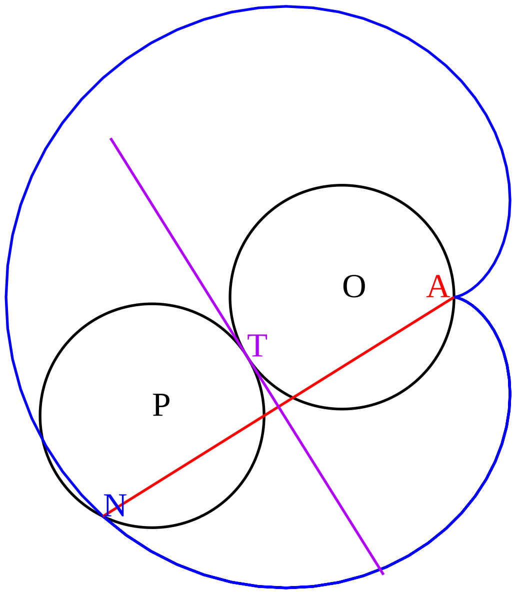
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



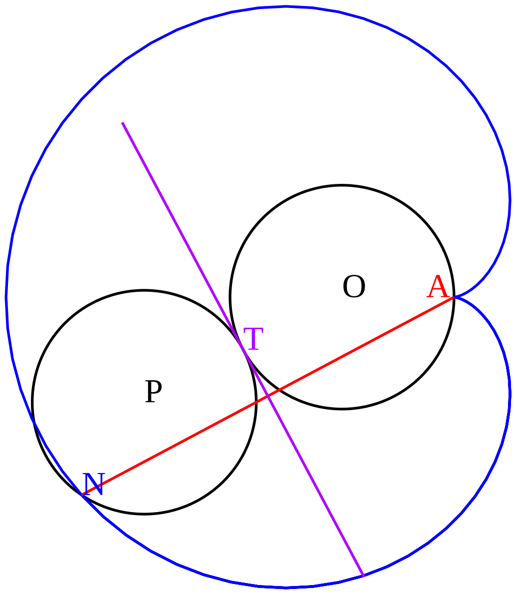
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



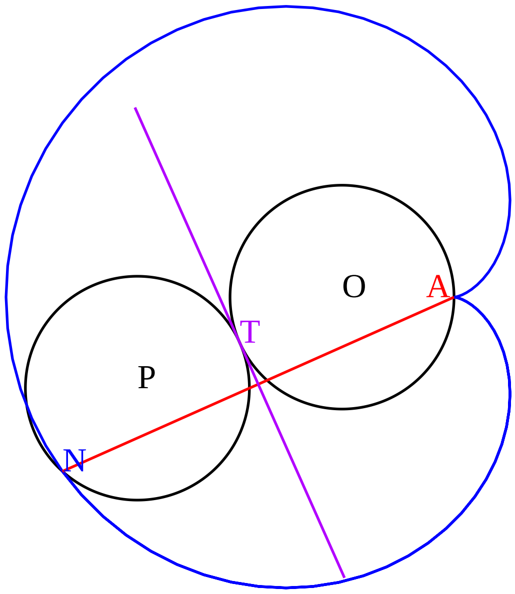
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



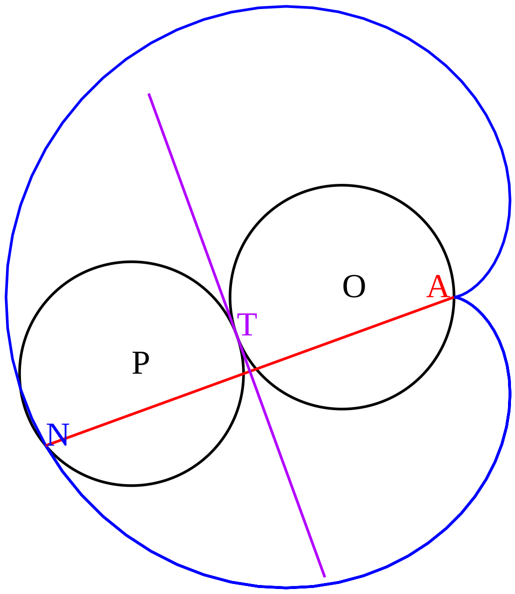
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



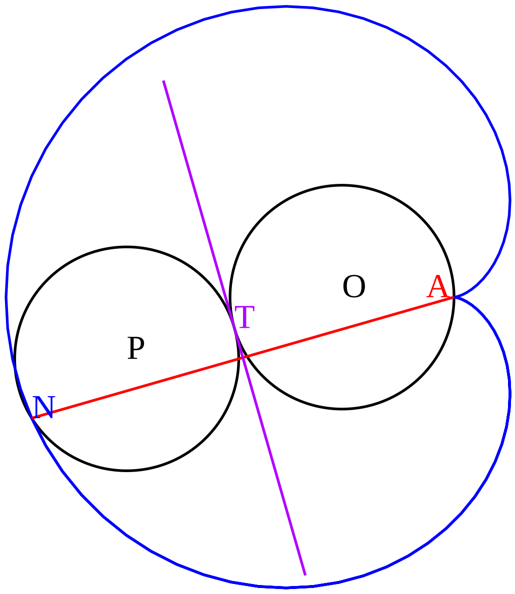
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



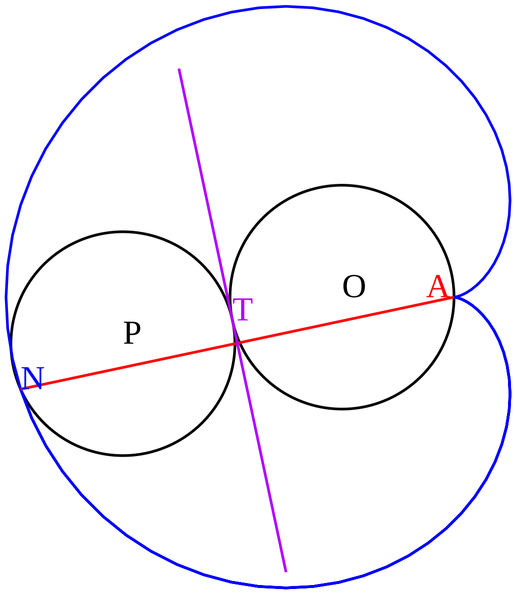
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



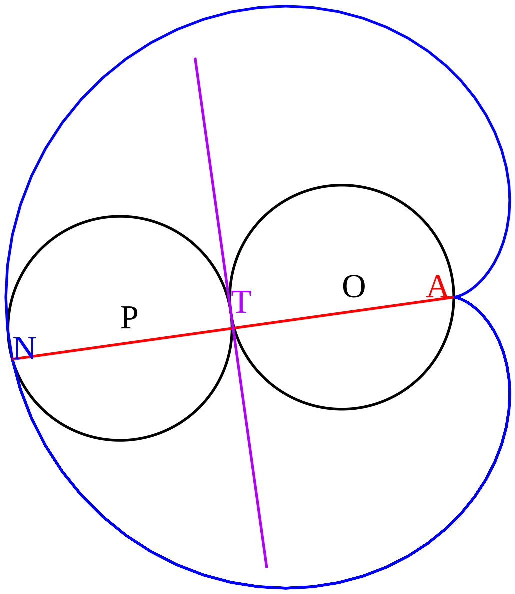
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



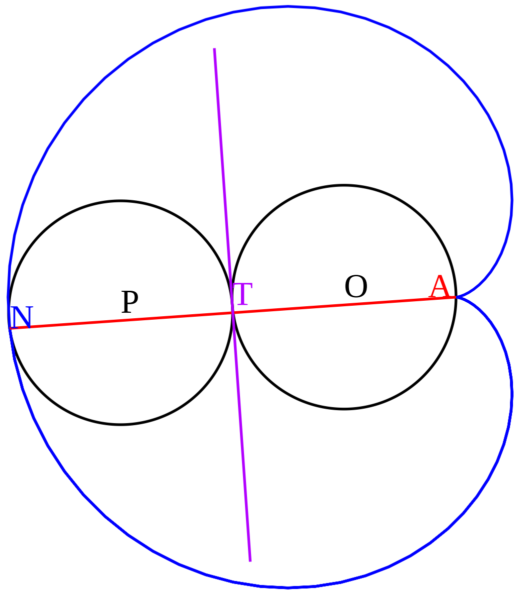
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



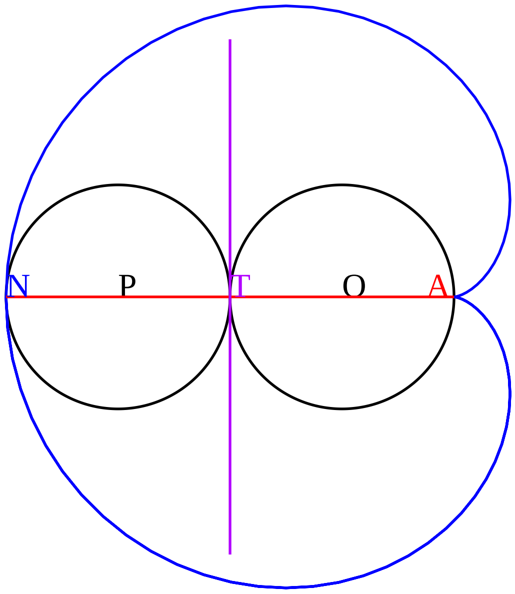
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



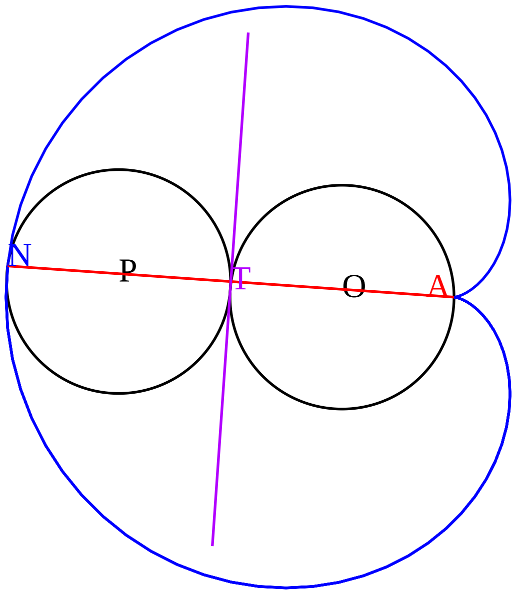
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



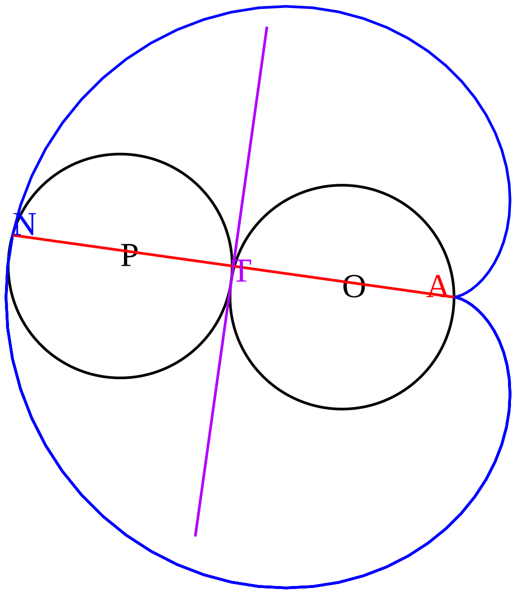
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



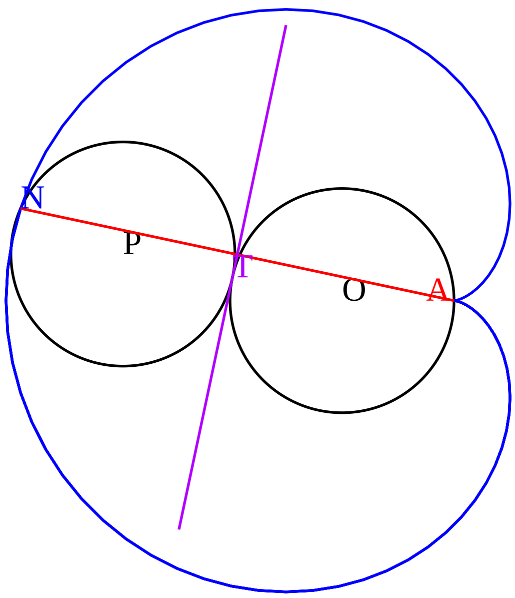
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



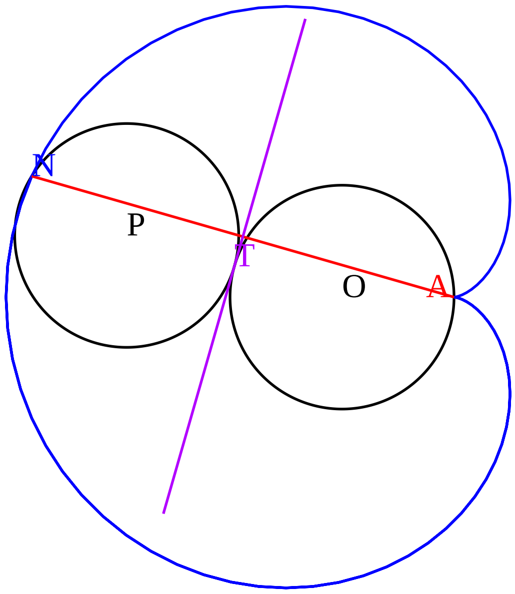
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



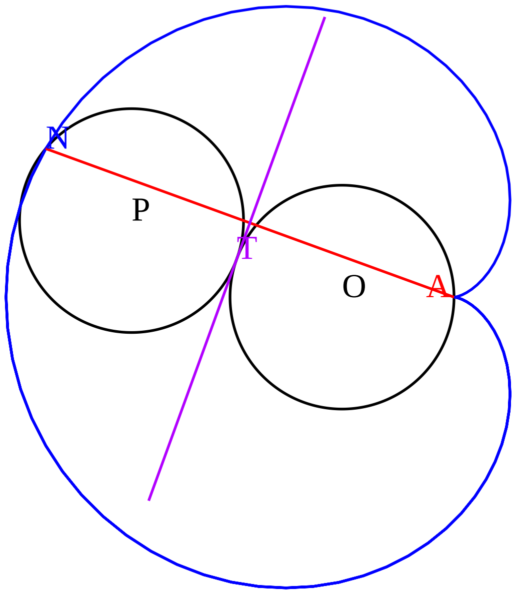
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



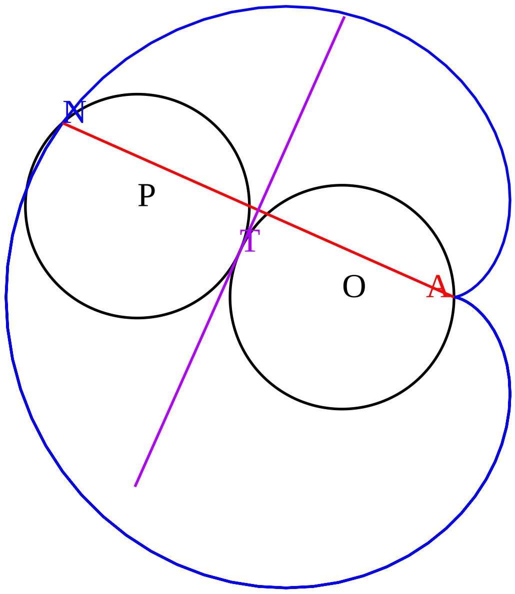
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



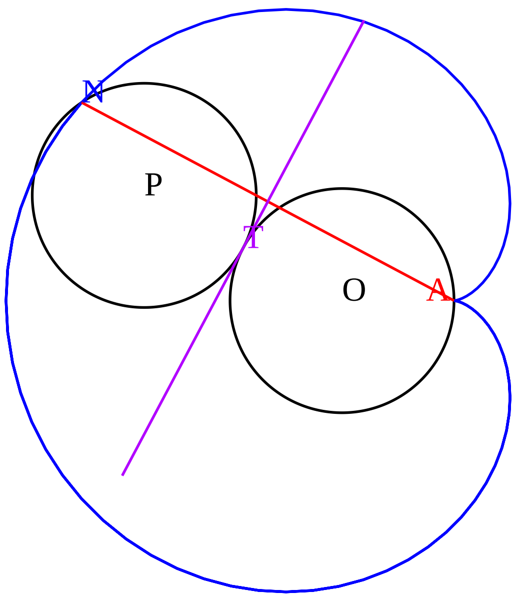
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



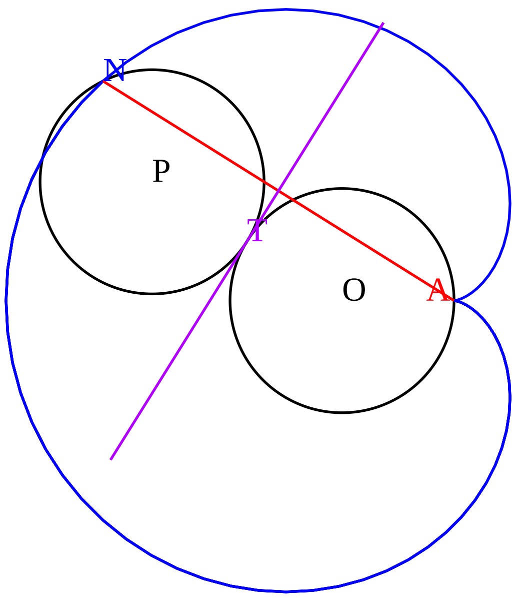
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



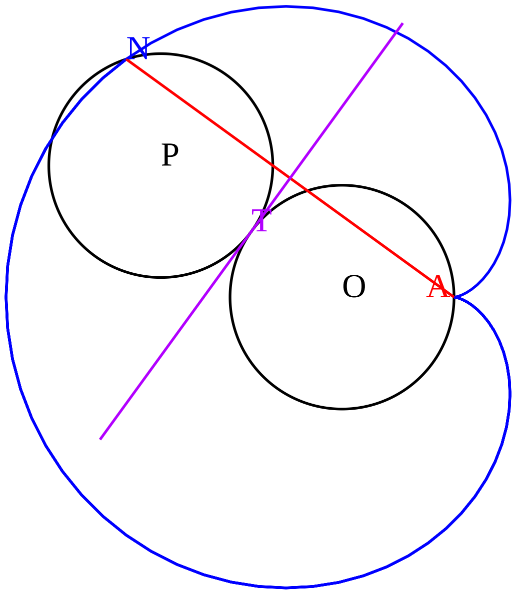
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



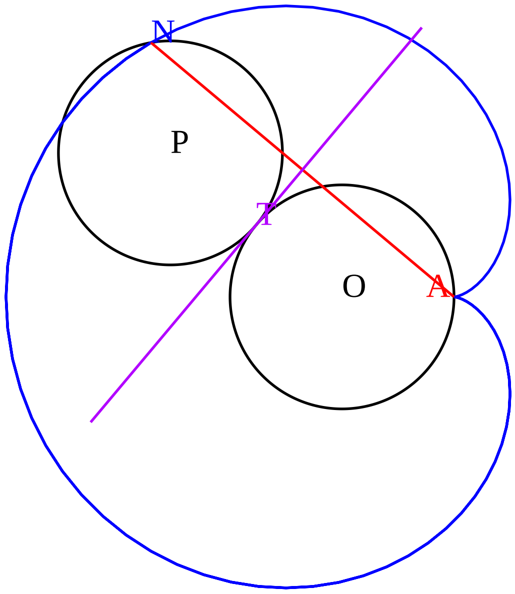
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



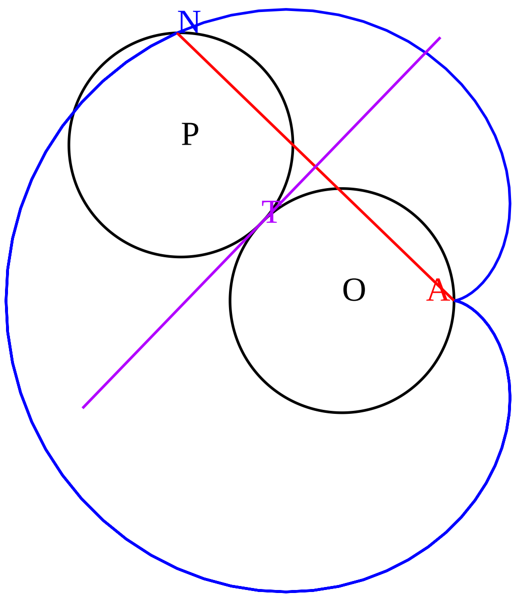
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



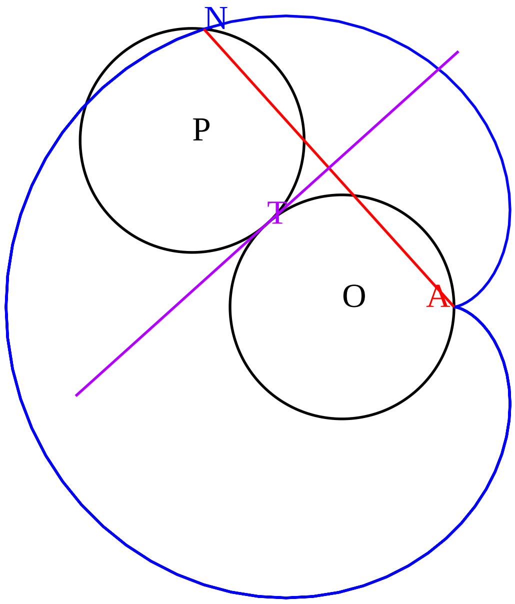
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



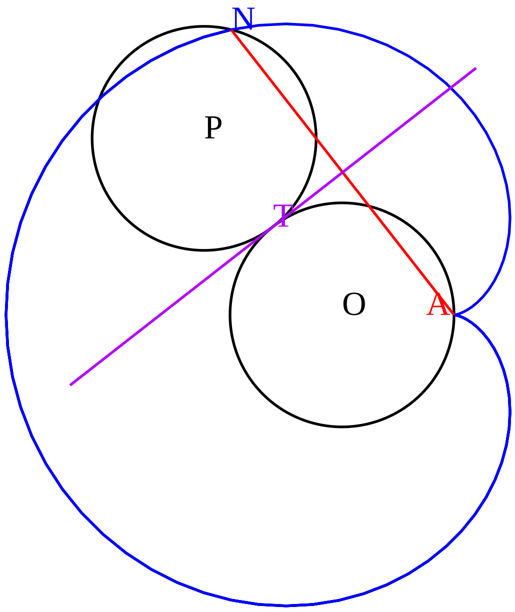
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



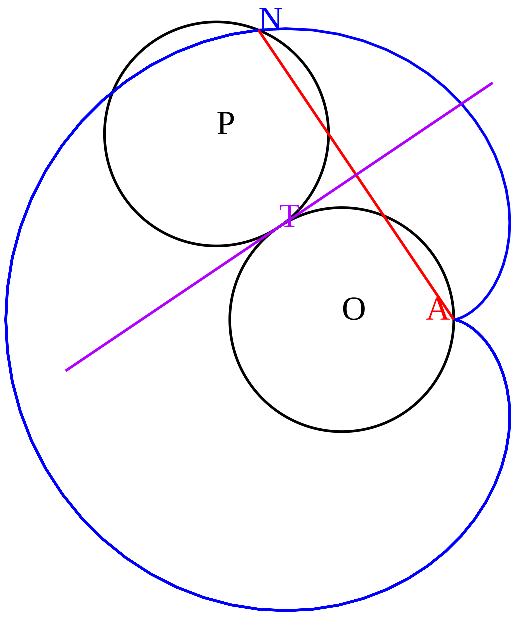
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



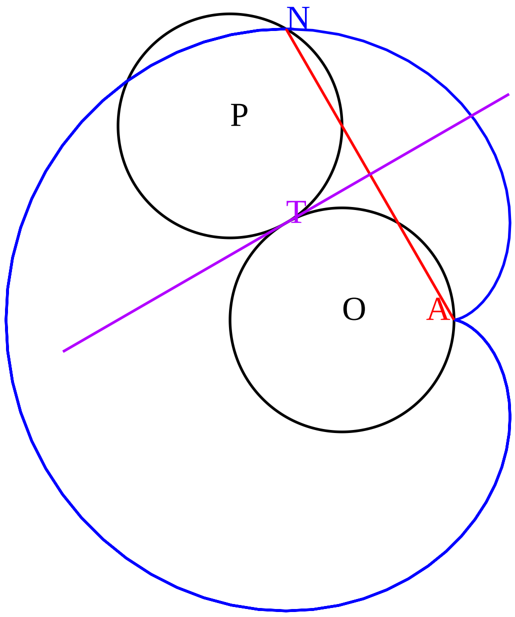
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



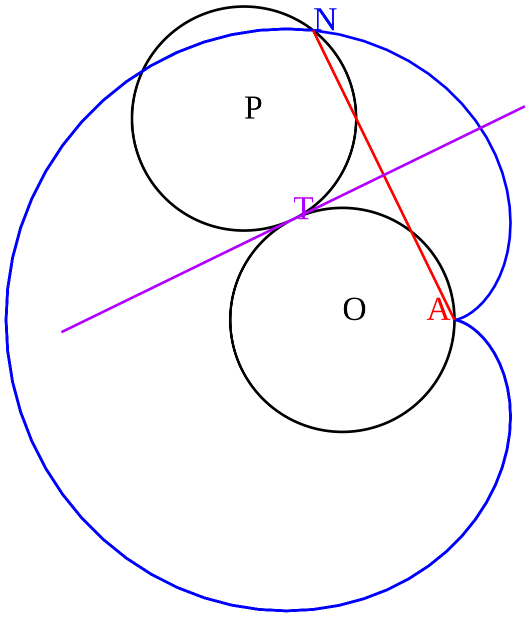
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



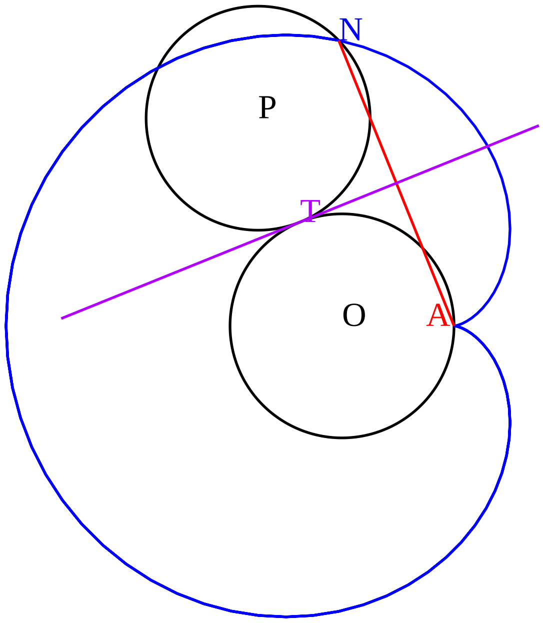
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



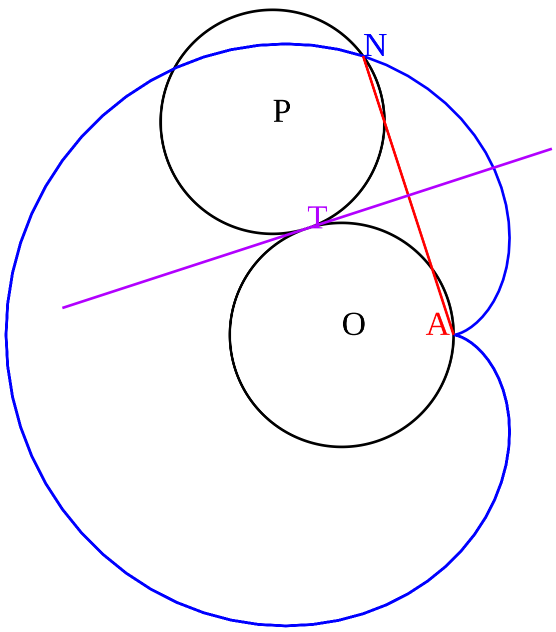
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



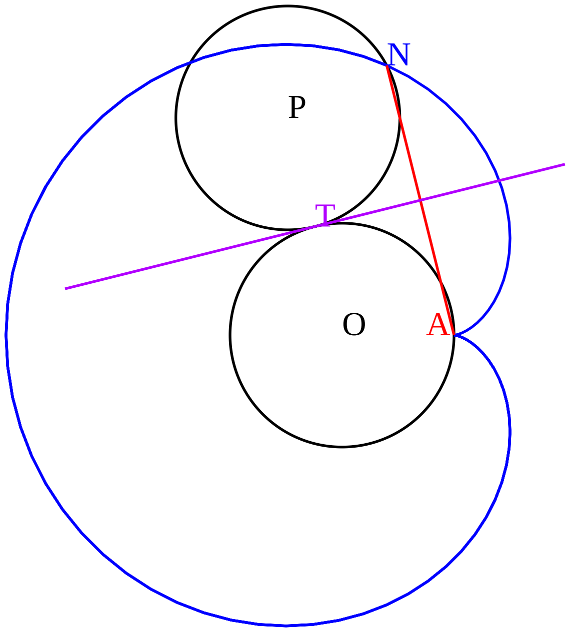
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



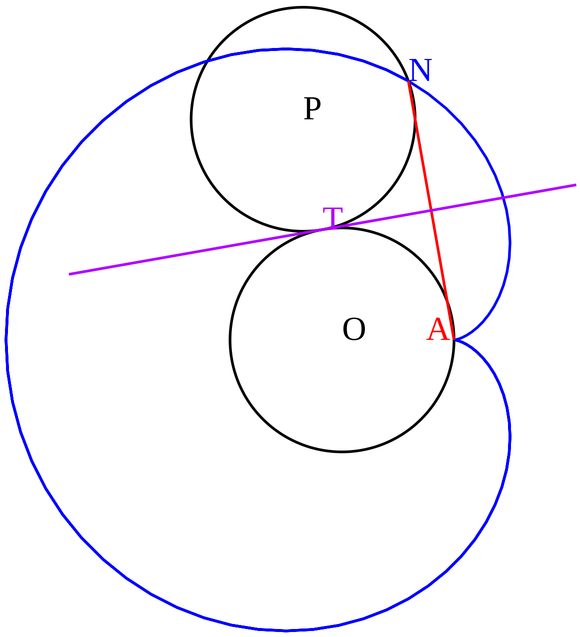
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



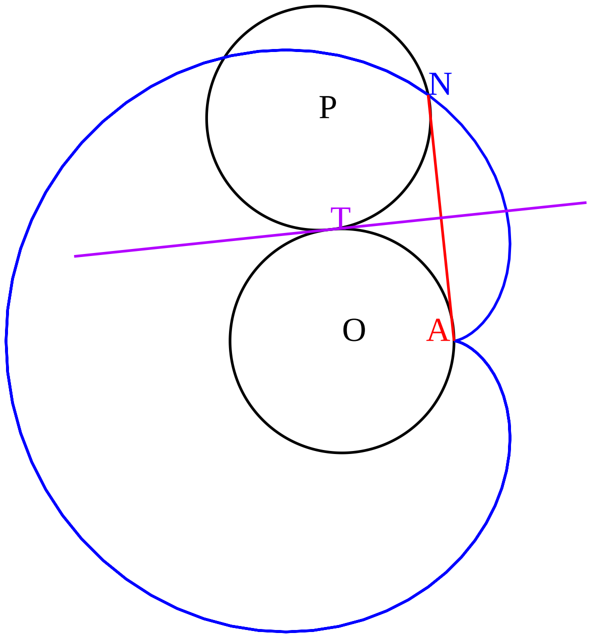
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



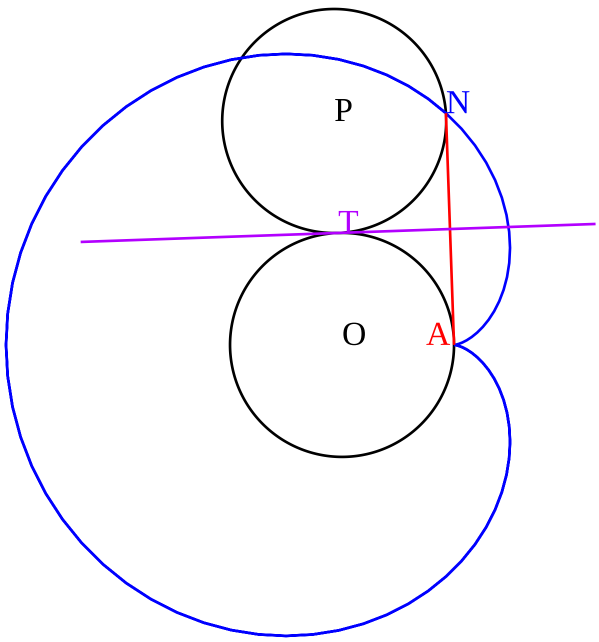
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



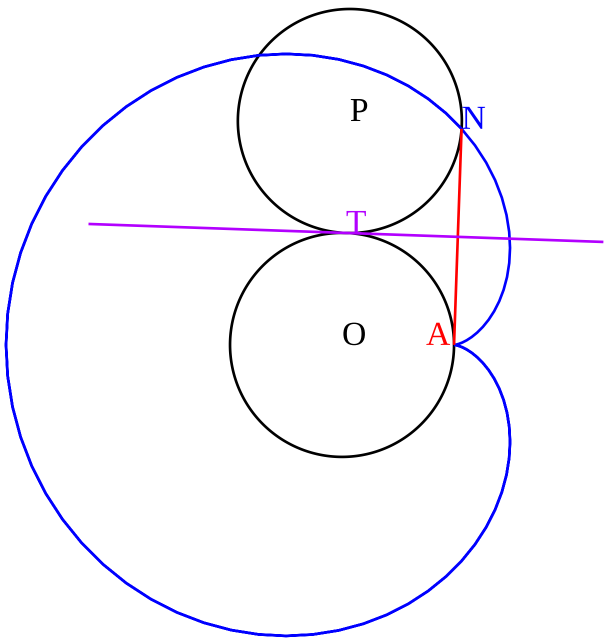
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



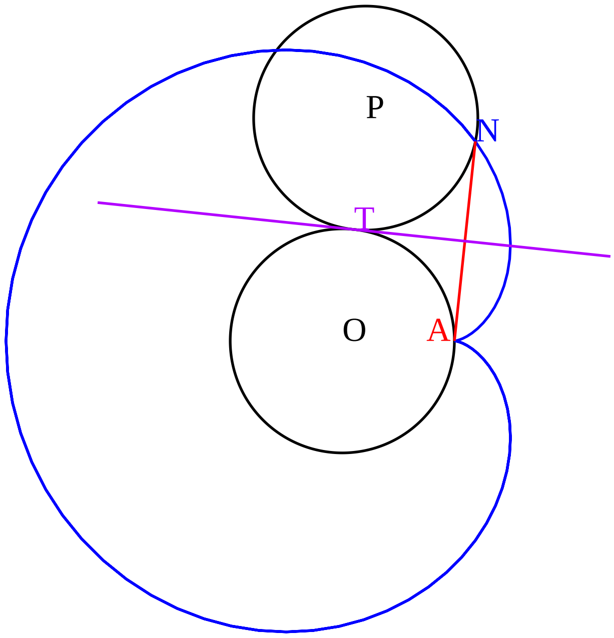
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



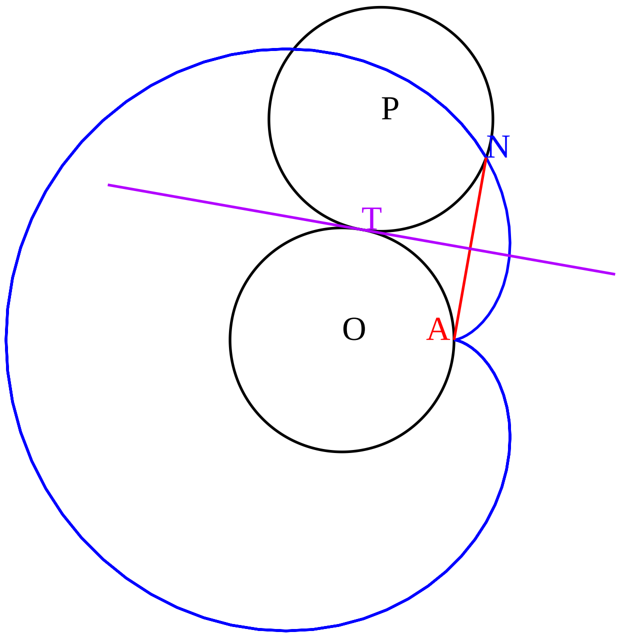
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



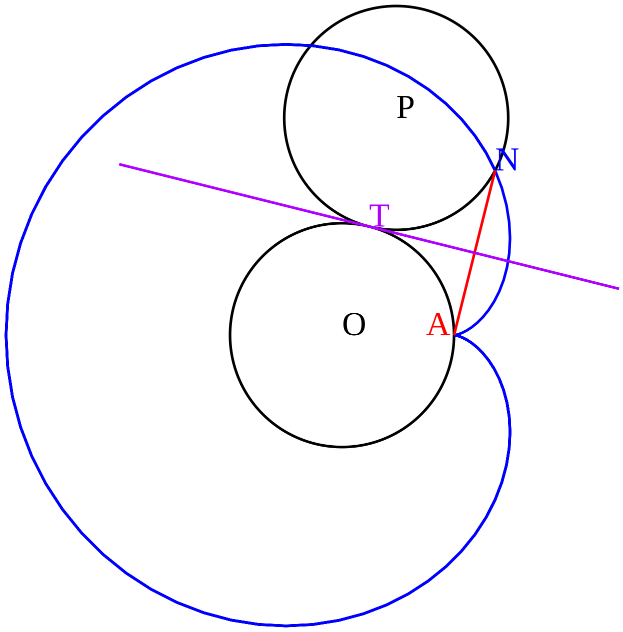
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



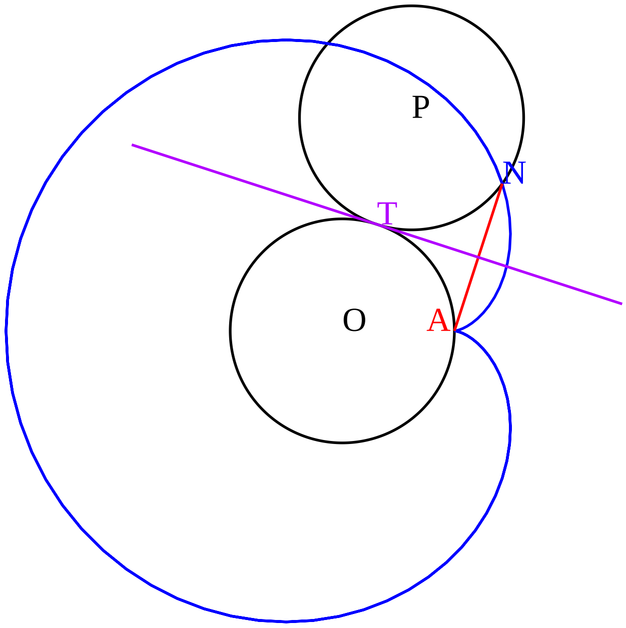
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



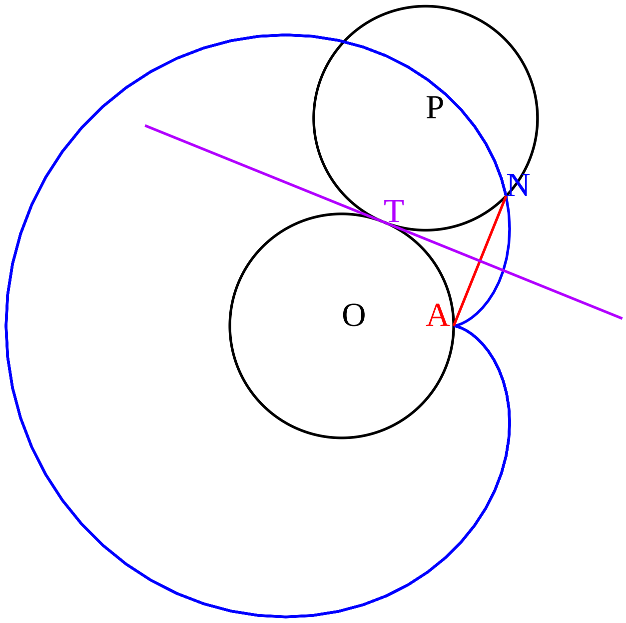
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



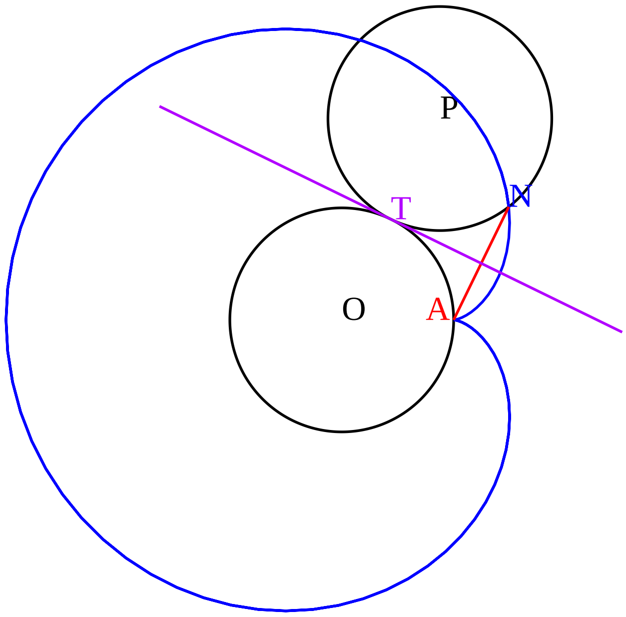
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



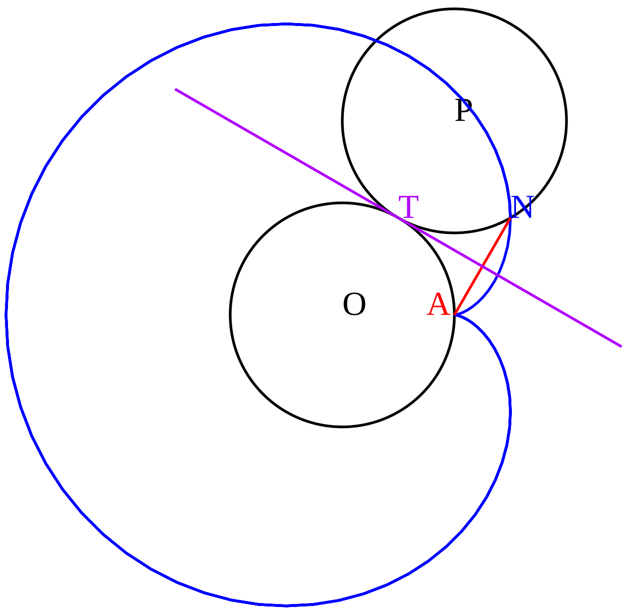
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



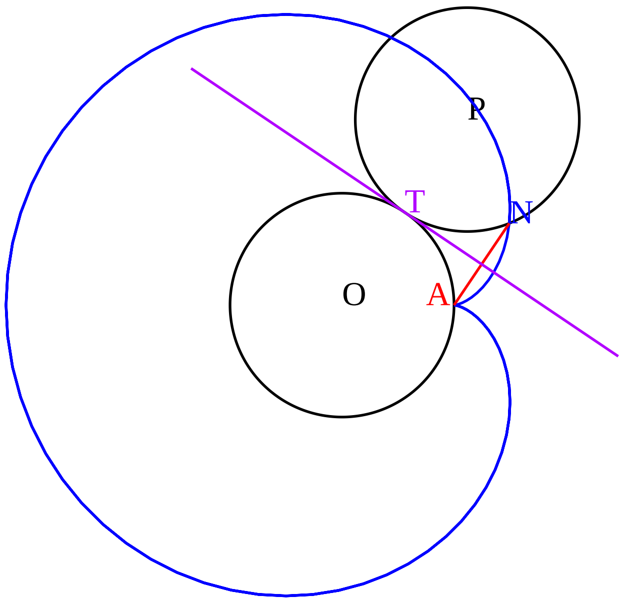
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



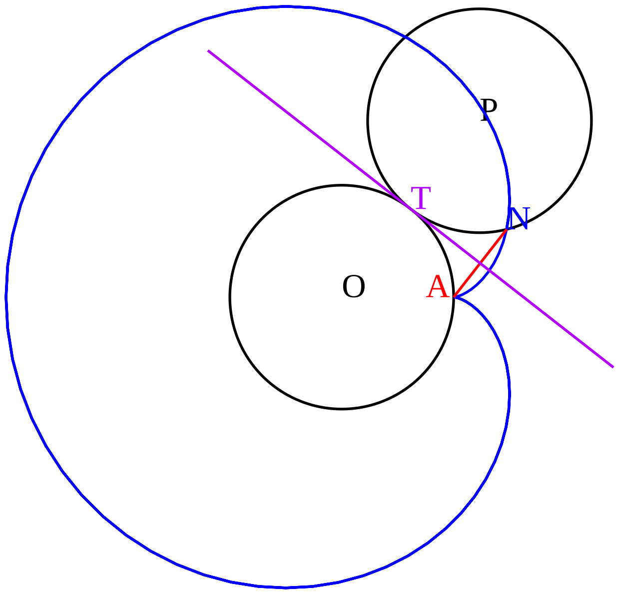
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



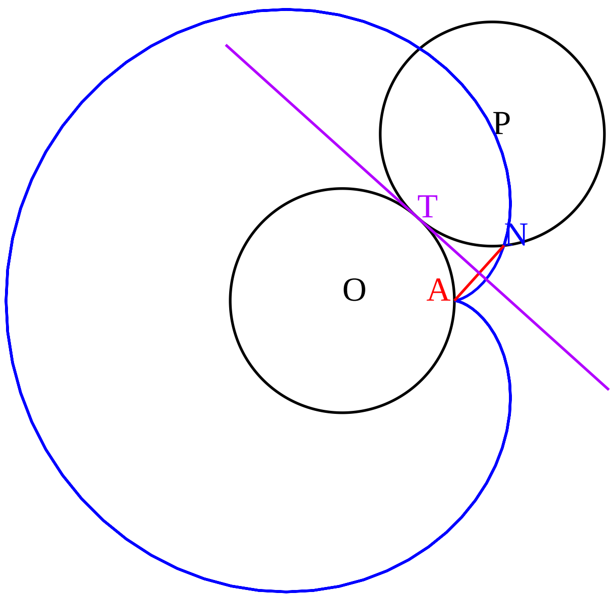
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



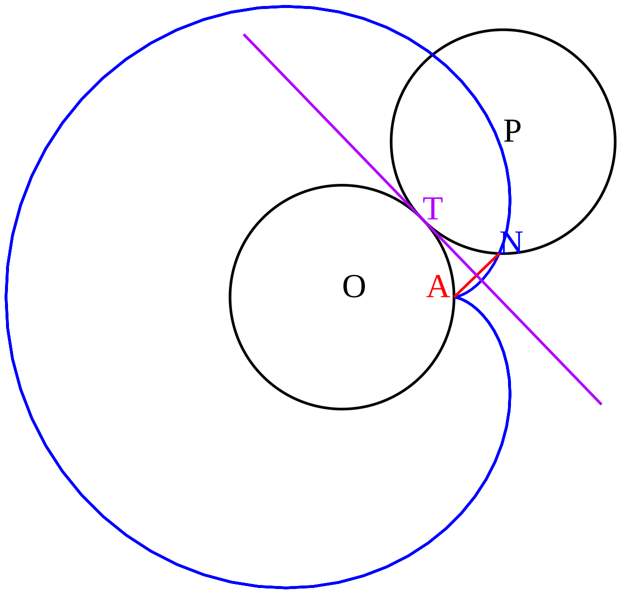
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



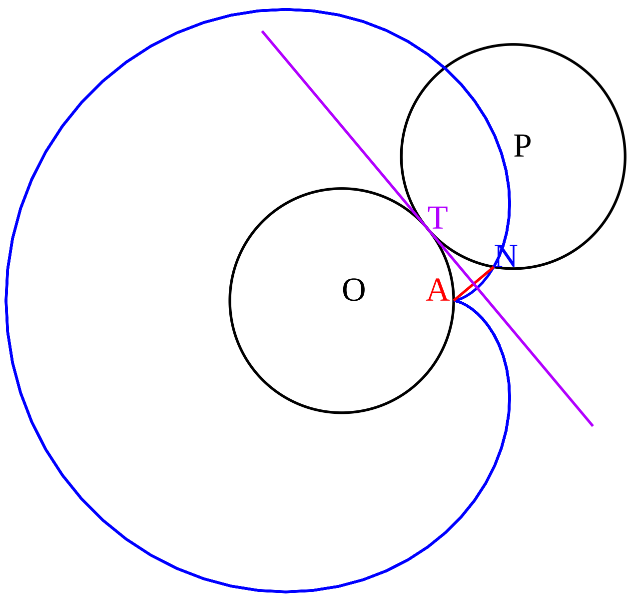
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



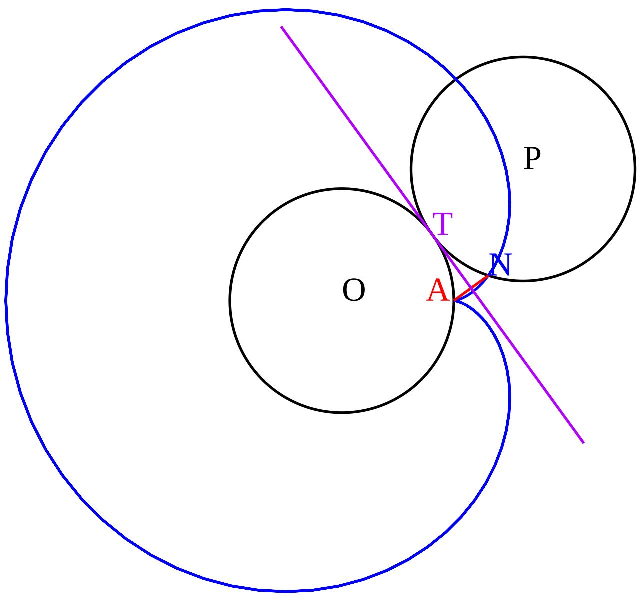
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



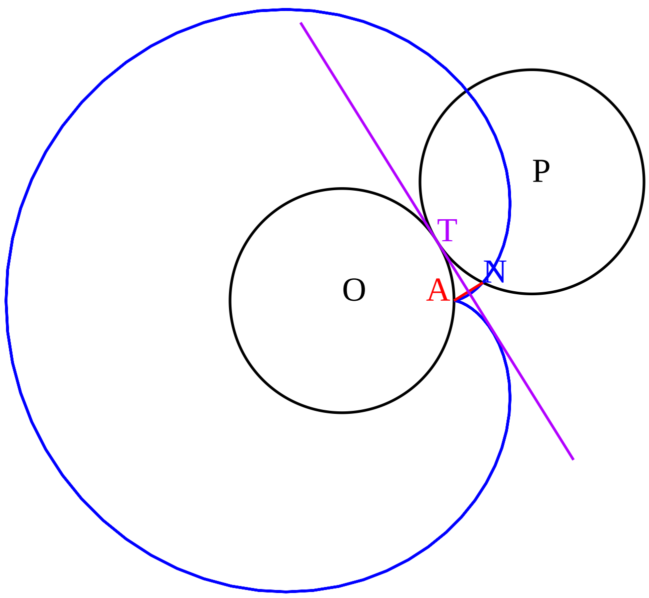
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



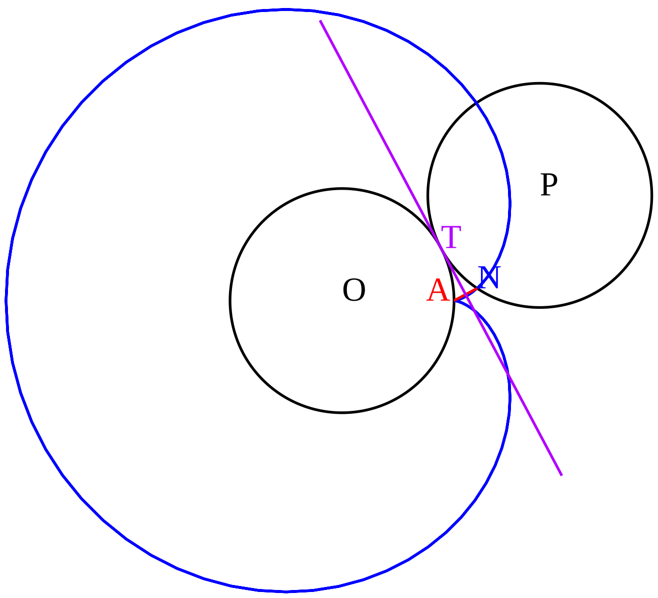
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



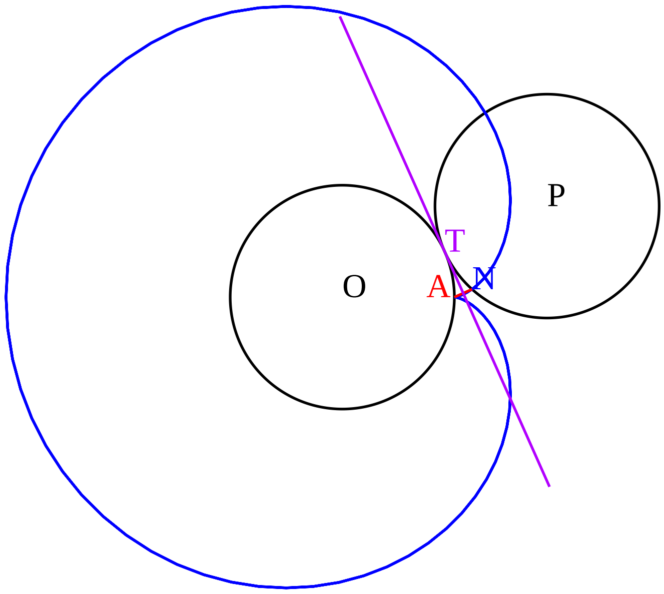
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



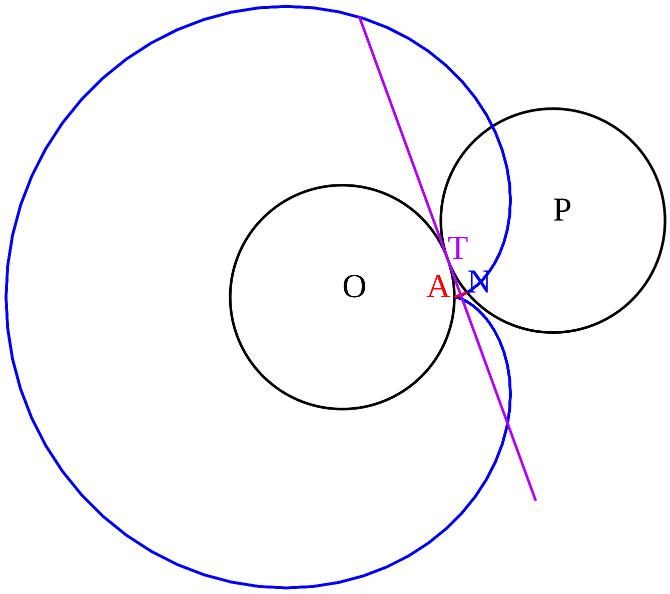
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



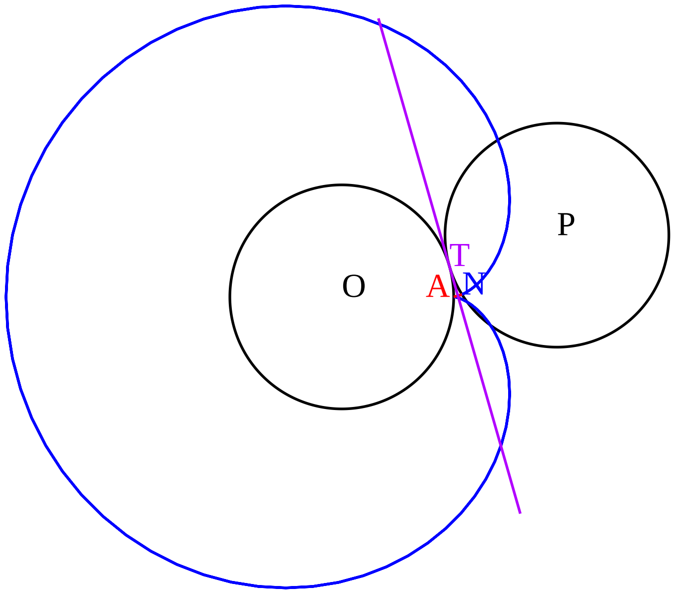
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



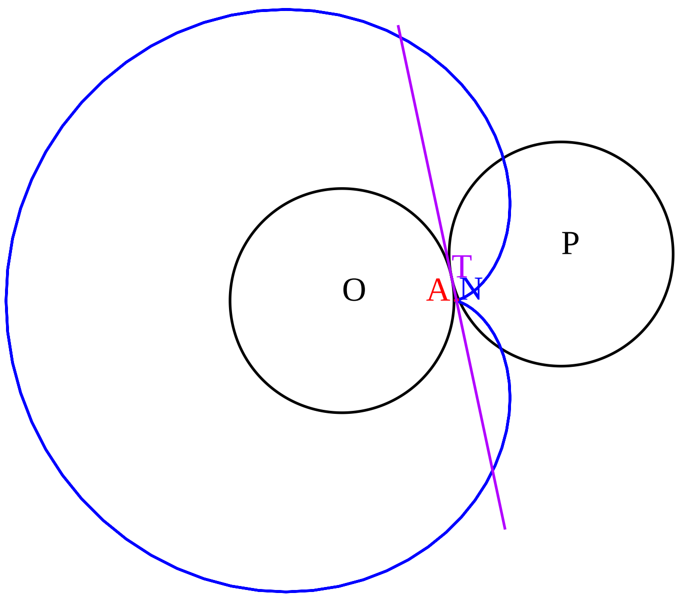
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



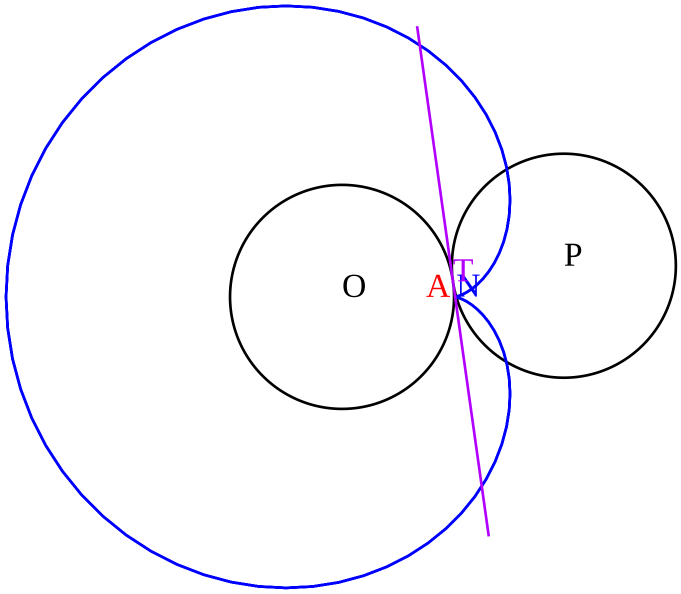
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



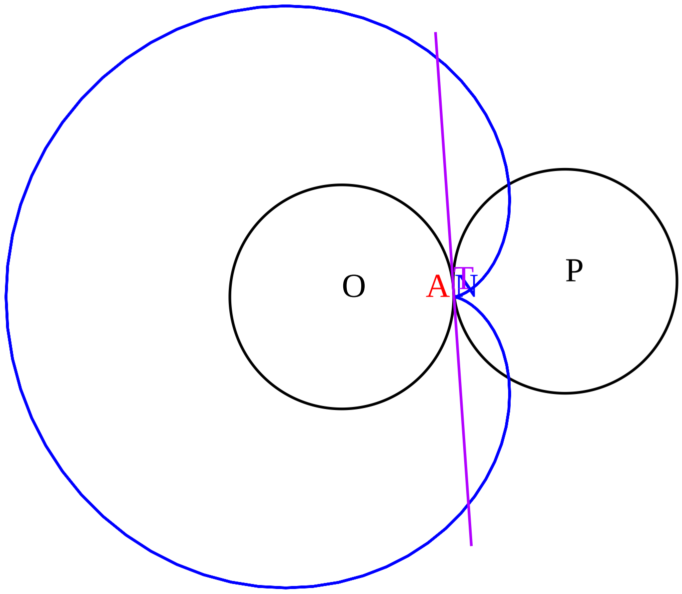
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



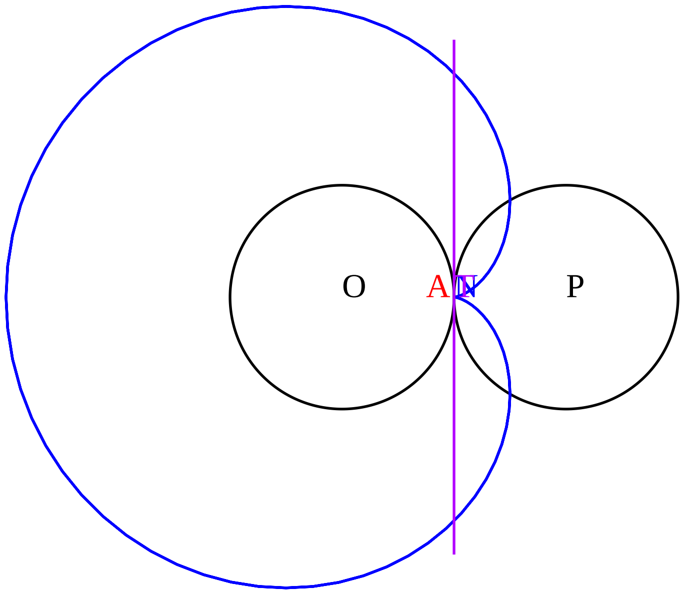
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



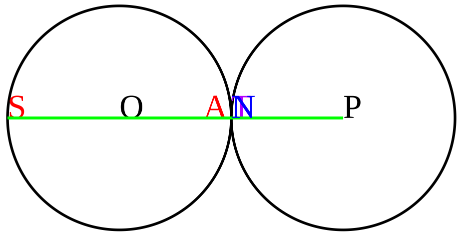
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



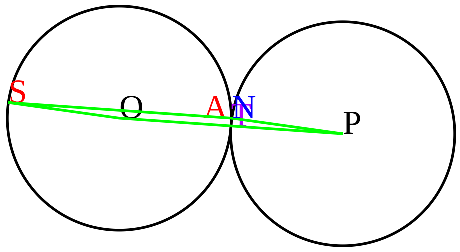
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



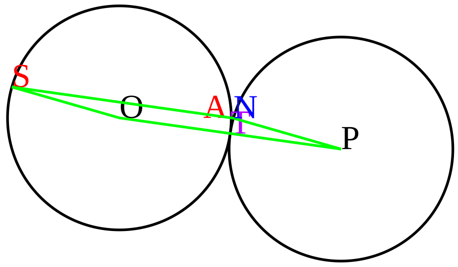
Cardioid is the points traced by a point (N) on a moving circle that rolls outside of a circle of equal radius. We start with two circles with centers at O (stationary) and P (moving.) Note three points A, N, and T. Initially they coincide. A fixed point (A) remains on the stationary circle. N is the point of the moving circle that traces a cardioid. T is the point of contact of the two circles and the violet line is the tangent line of two circles. The fact that the motion is without slipping is more accurately expressed as the congruence of the corresponding arcs TA and TN of the two circles. The symmetry is obviously with respect to the perpendicular bisector of the segment AN.



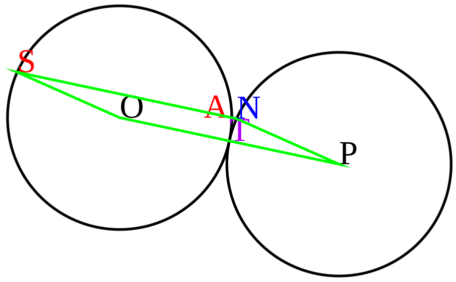
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



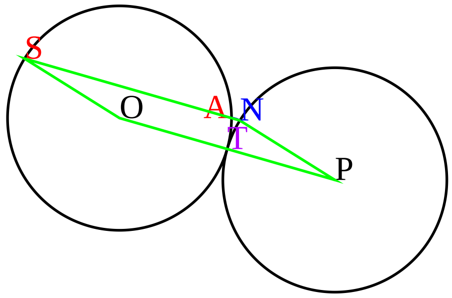
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



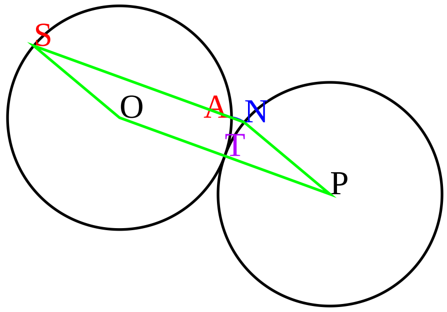
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



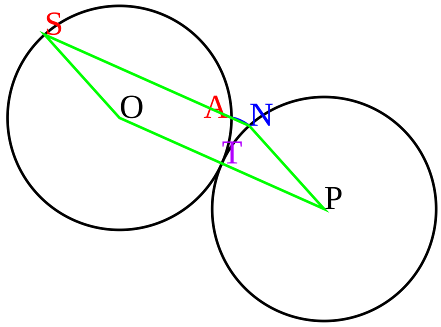
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



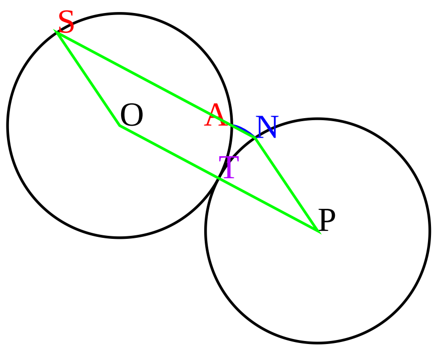
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



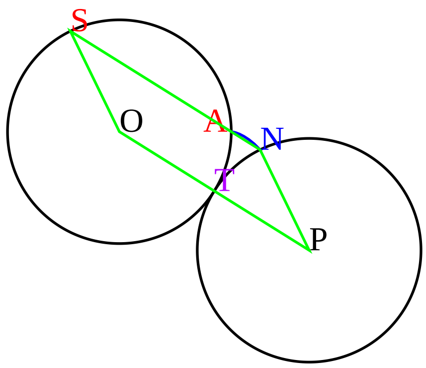
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



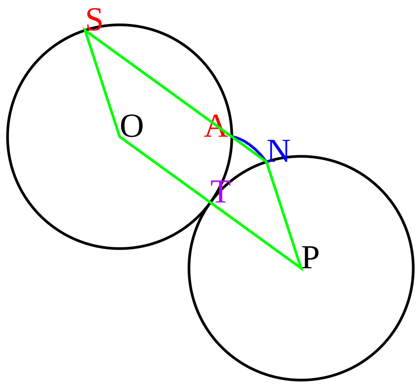
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



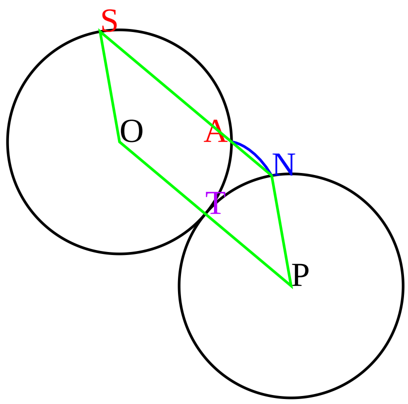
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



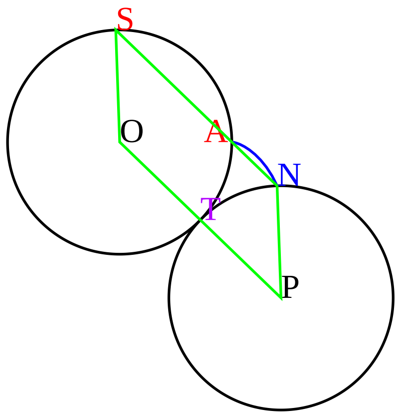
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



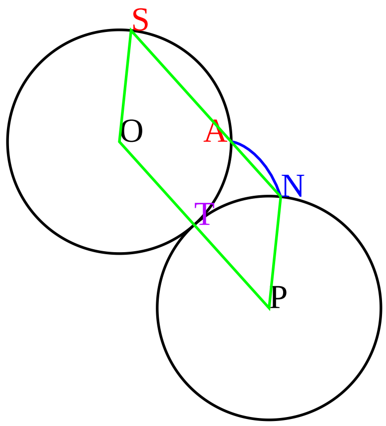
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



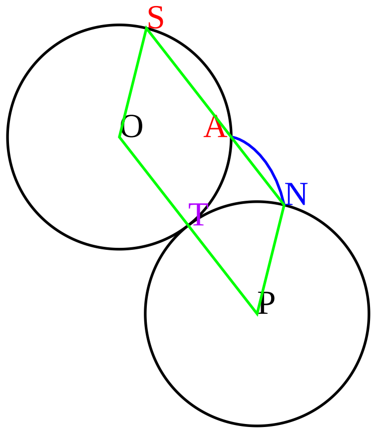
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



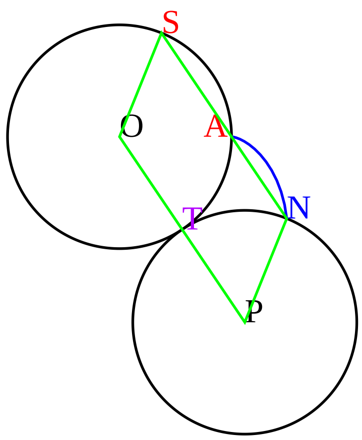
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



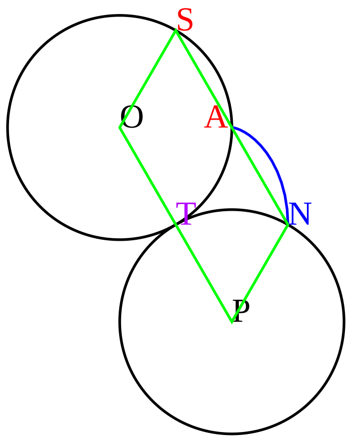
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



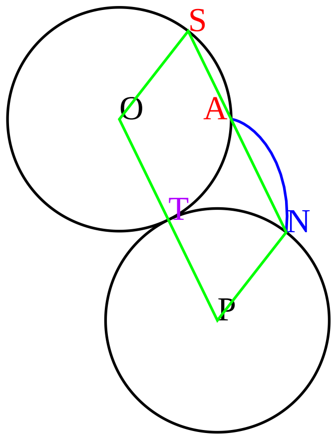
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



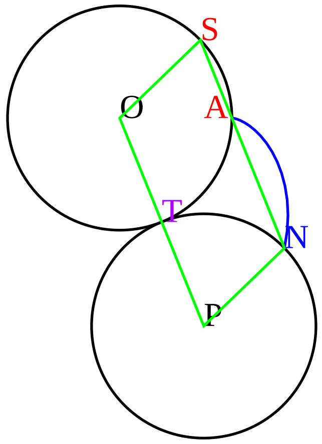
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



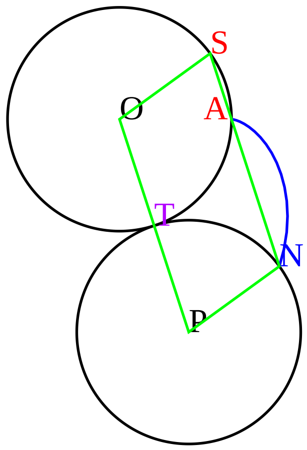
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



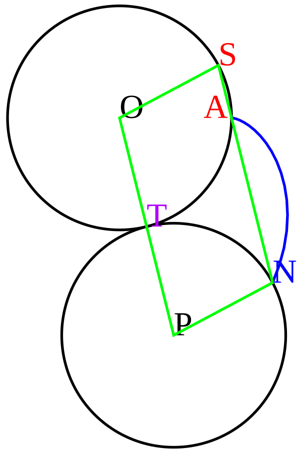
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



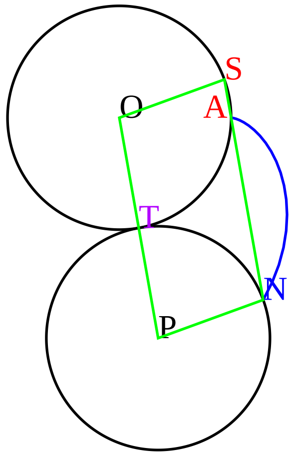
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



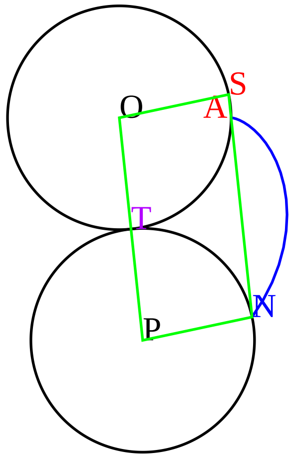
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



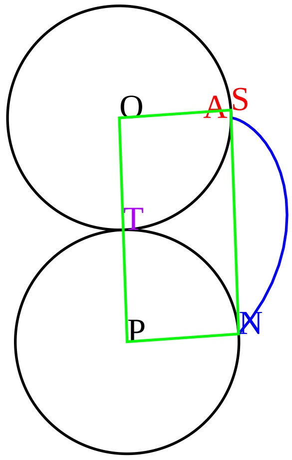
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



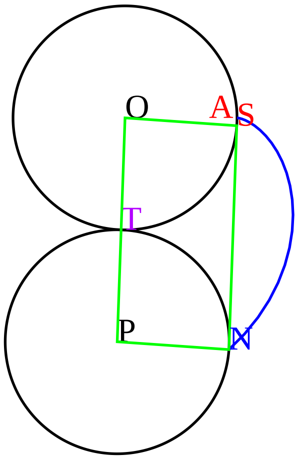
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



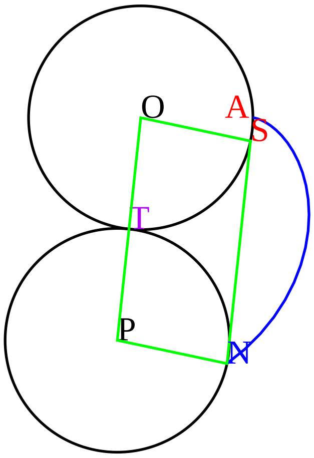
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



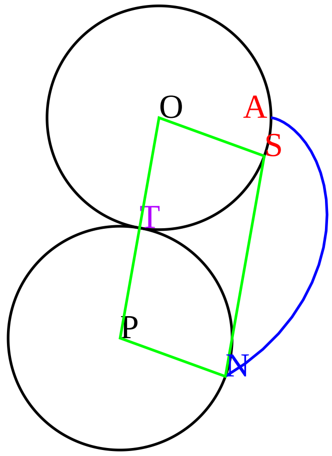
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



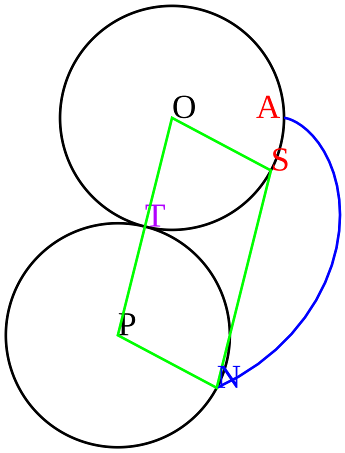
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



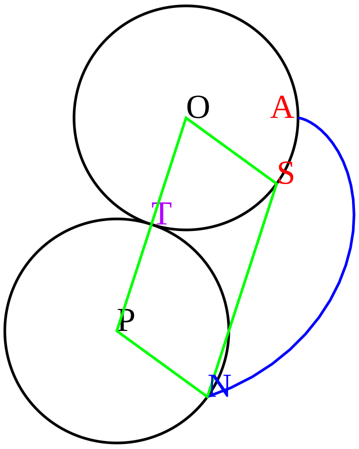
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



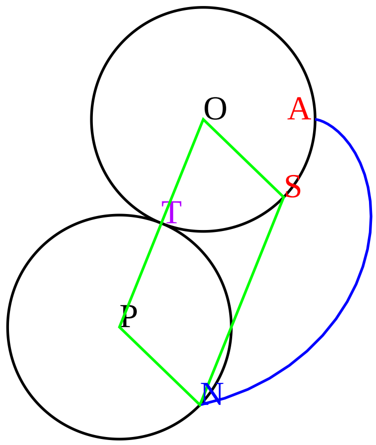
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



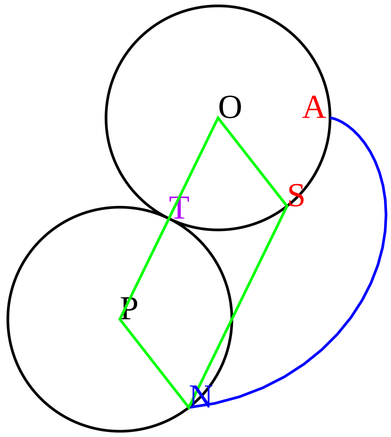
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



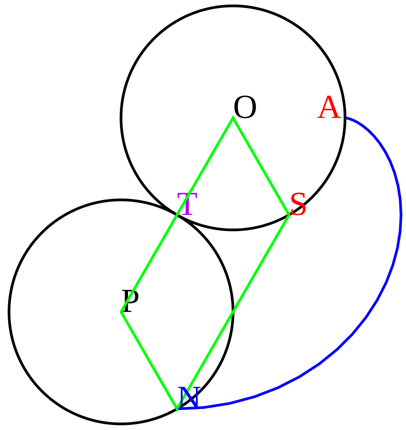
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



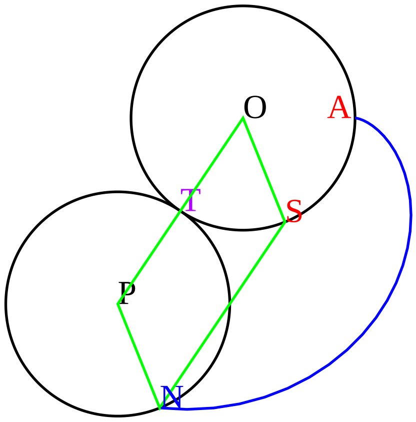
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



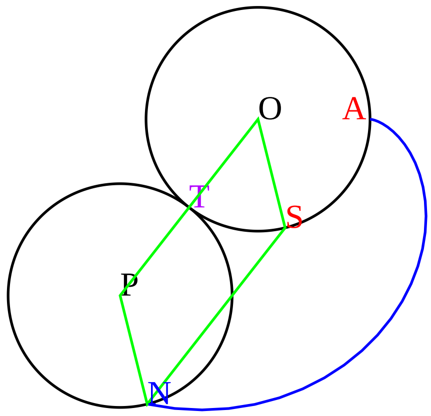
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



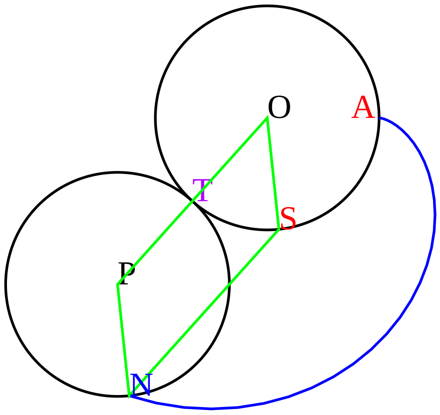
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



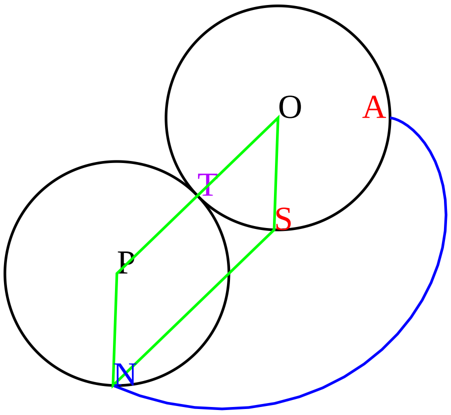
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



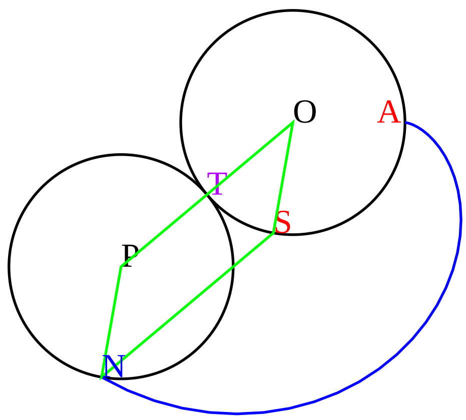
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



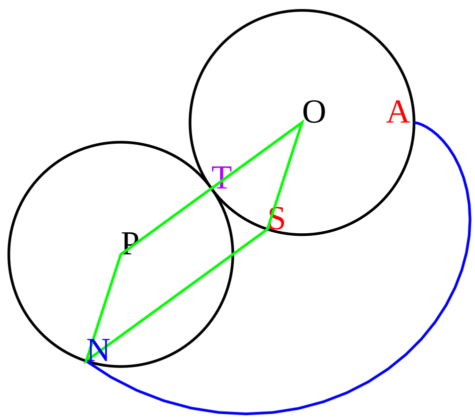
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



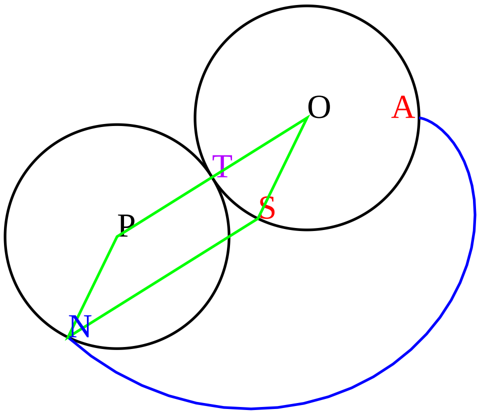
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



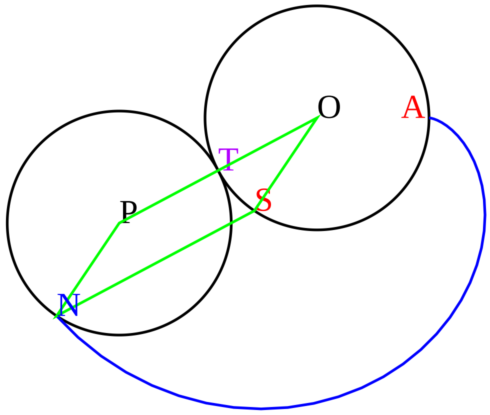
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



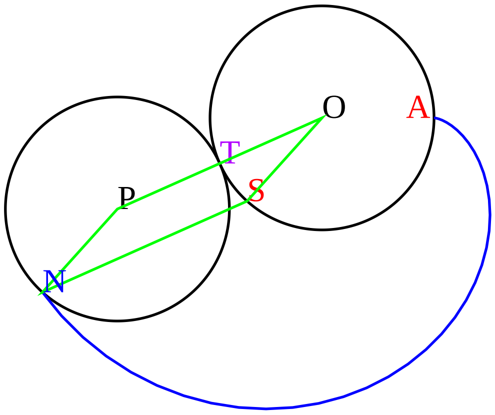
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



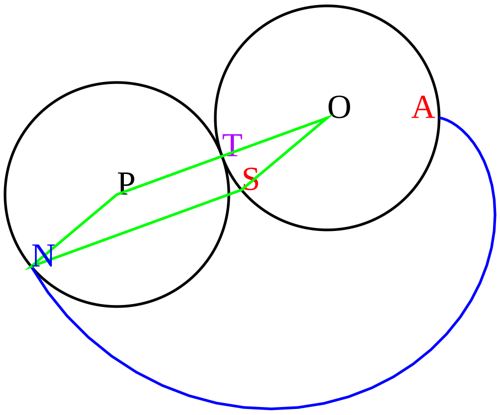
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



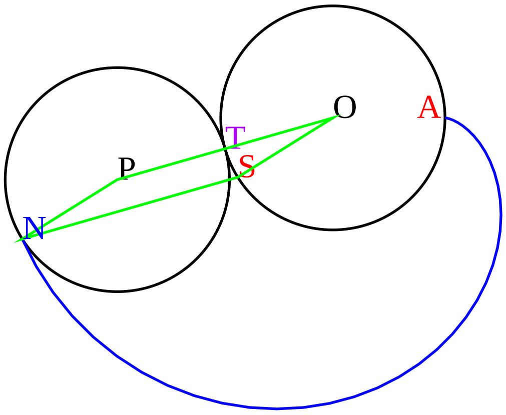
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



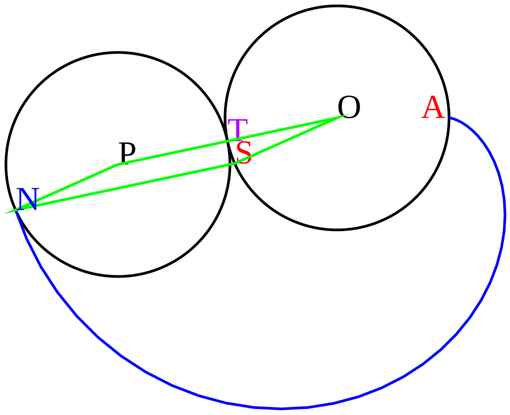
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



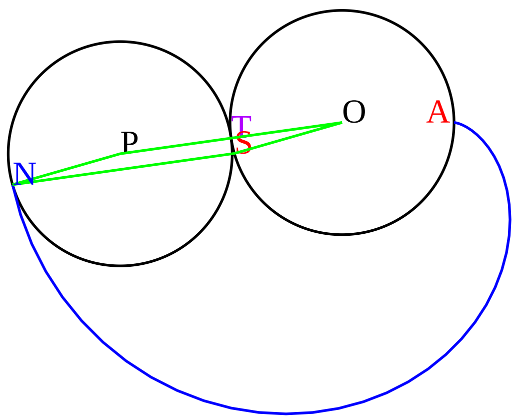
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



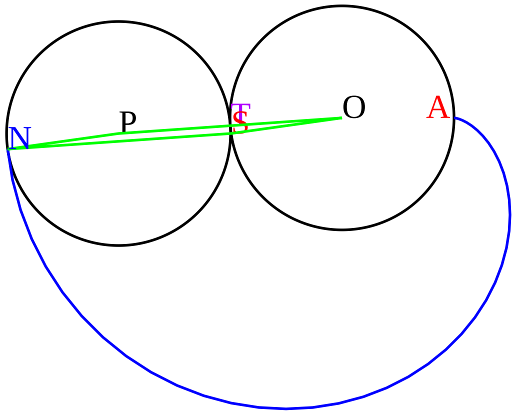
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



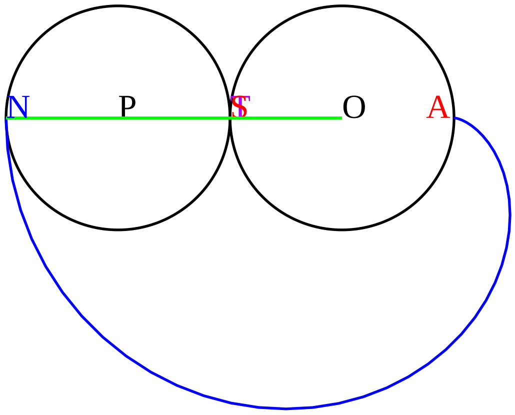
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



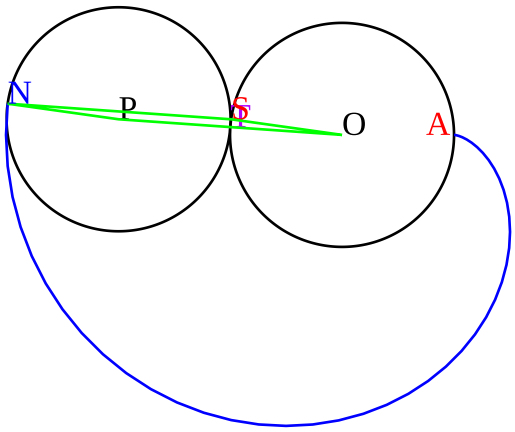
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



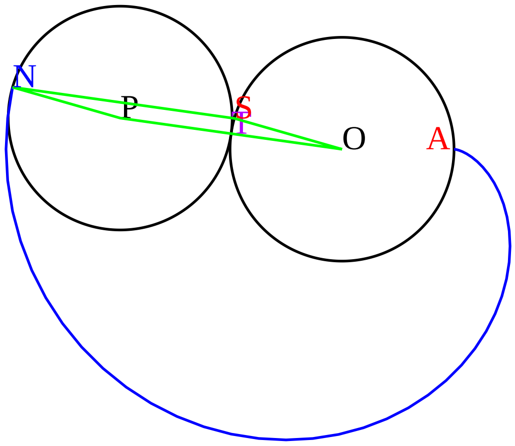
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



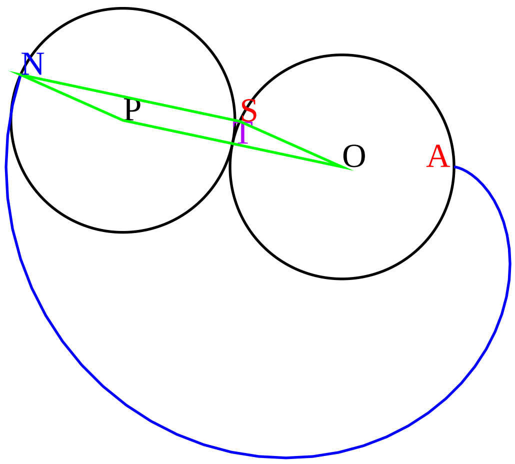
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



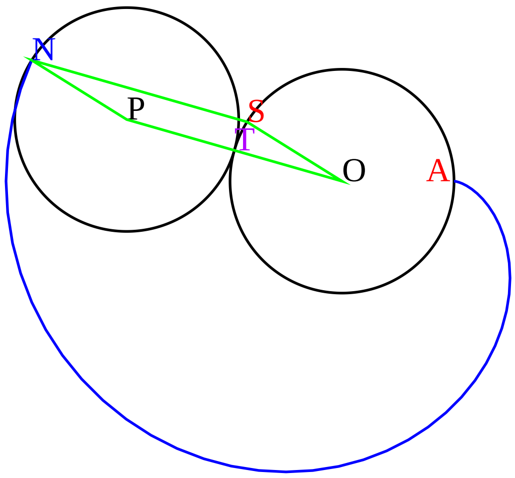
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



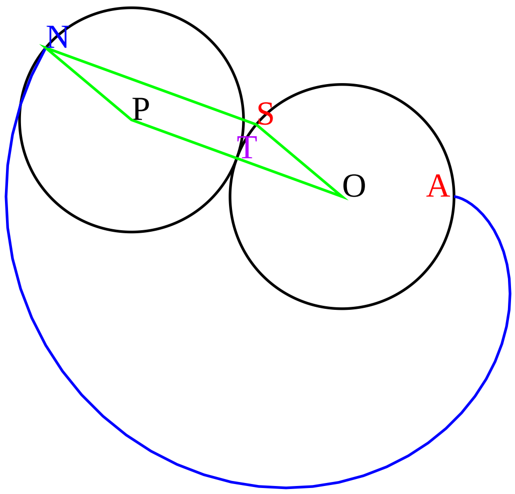
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



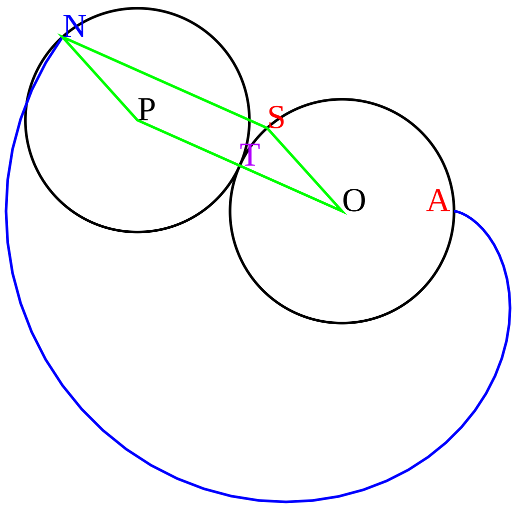
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



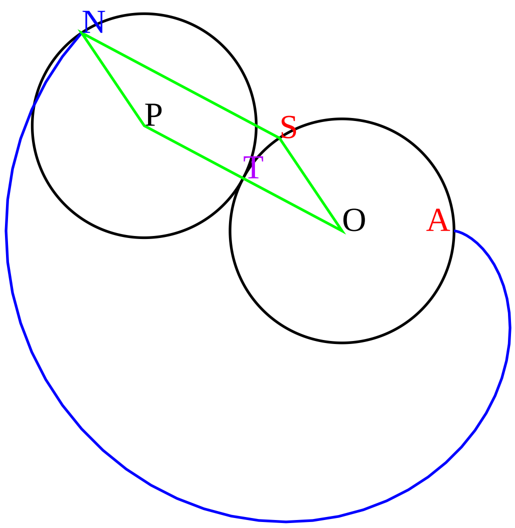
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



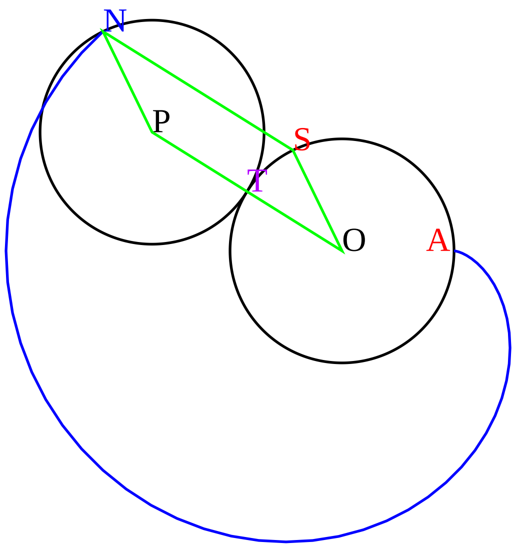
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



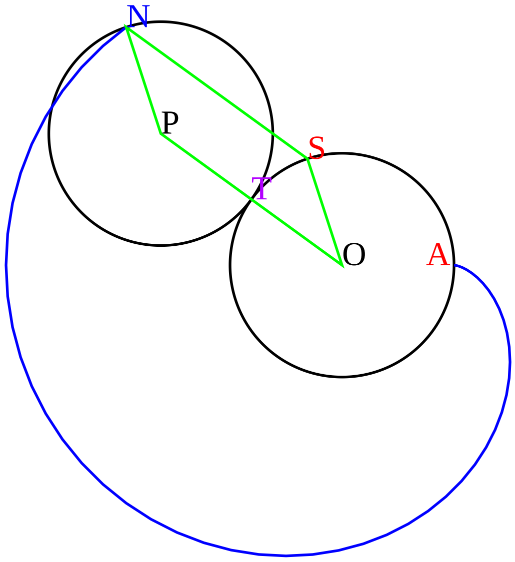
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



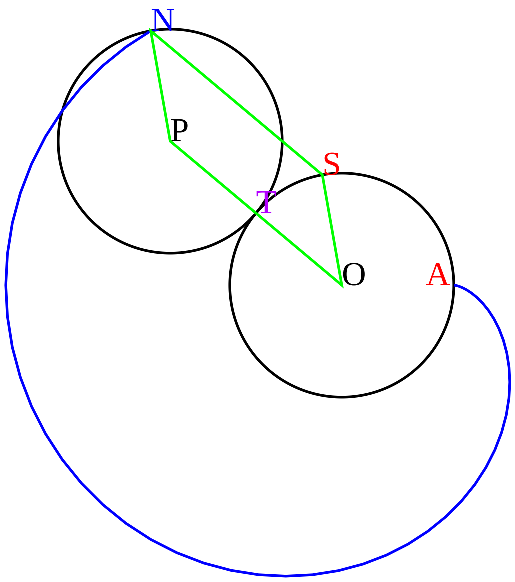
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



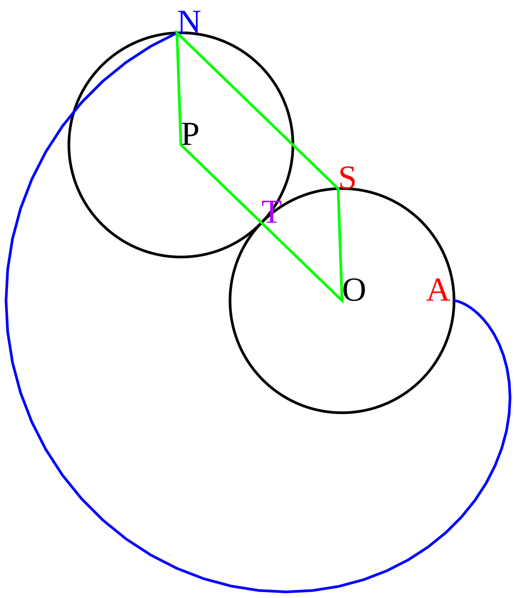
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



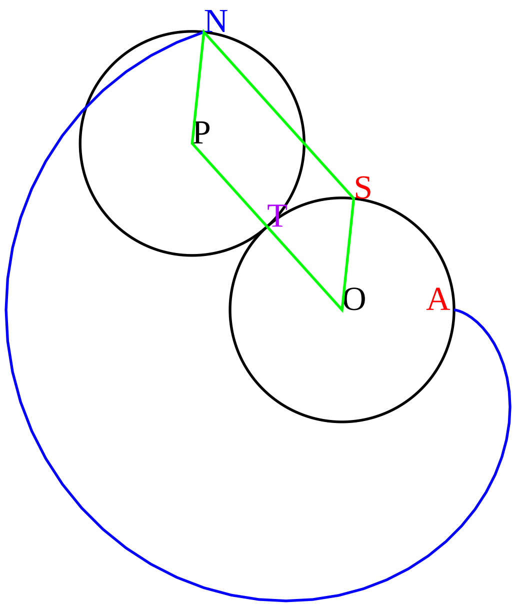
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



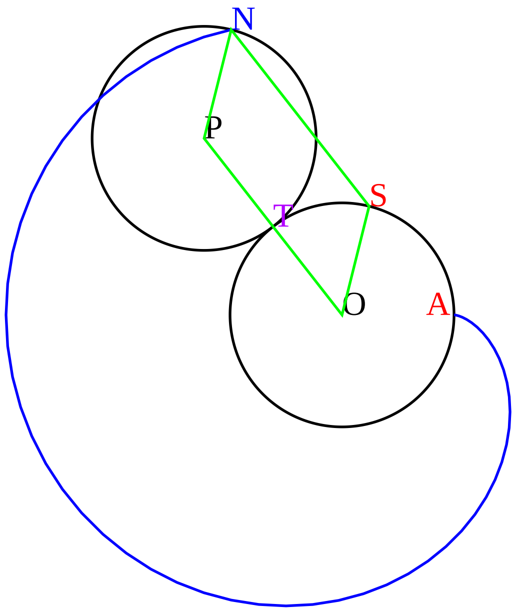
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



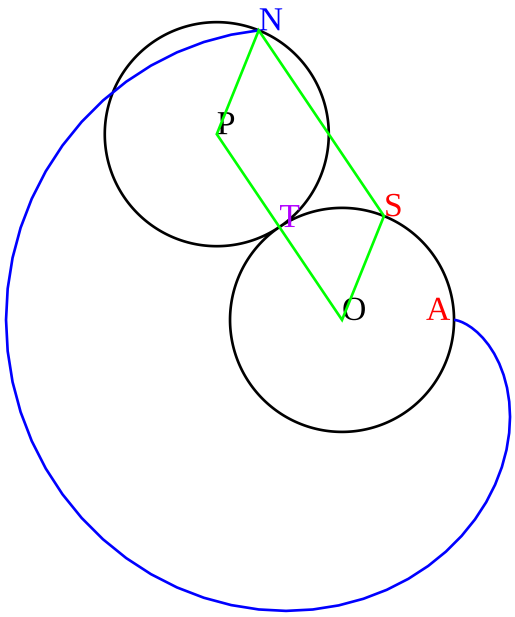
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



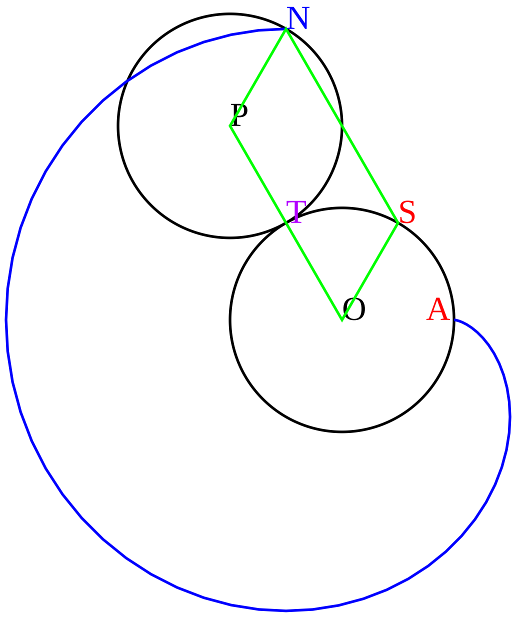
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



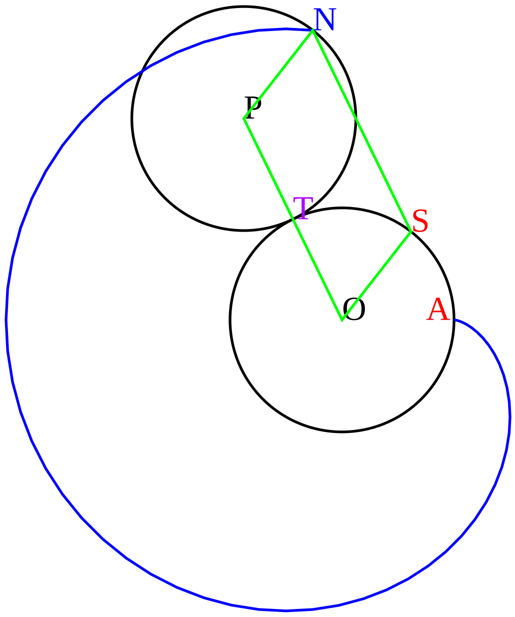
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



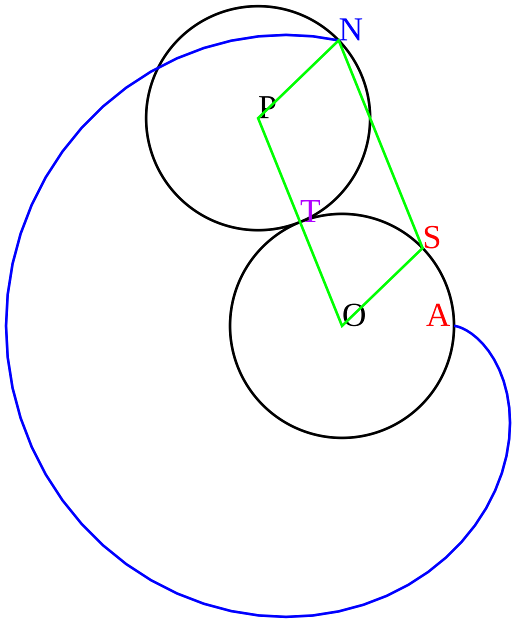
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



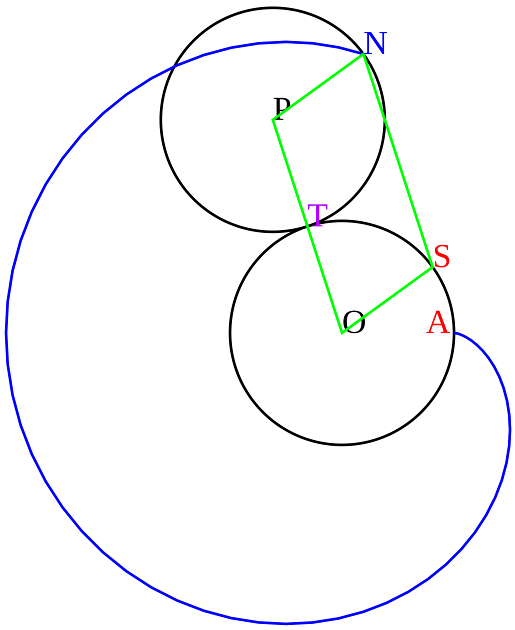
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



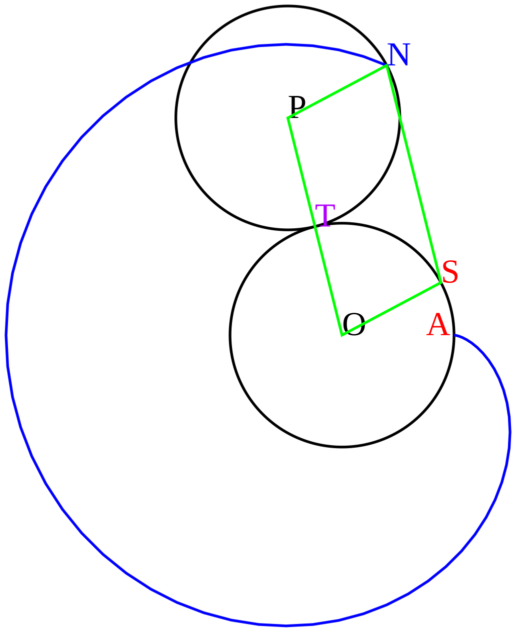
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



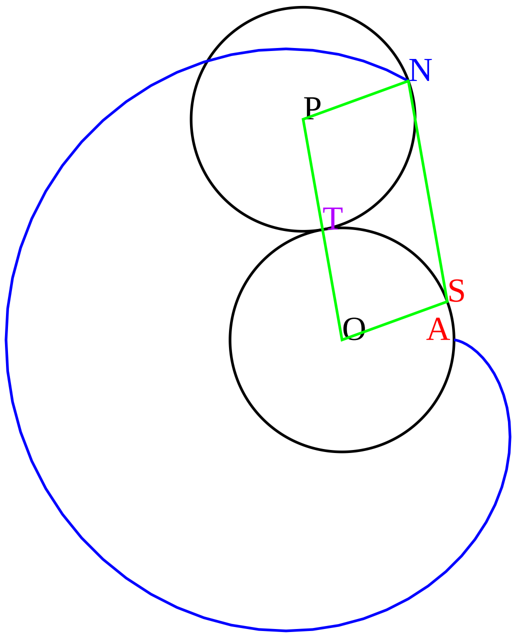
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



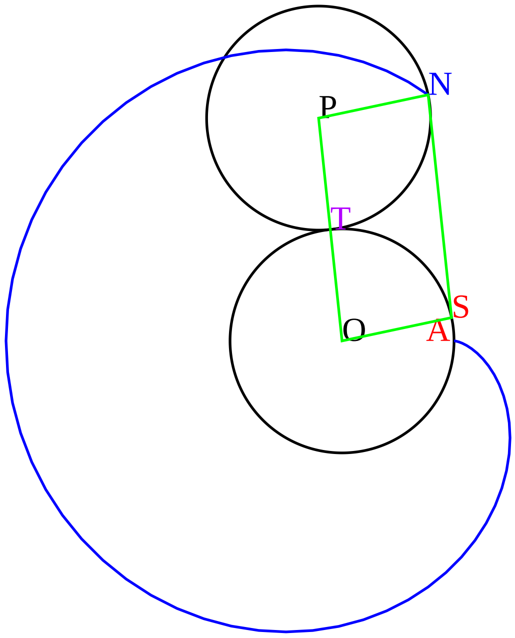
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



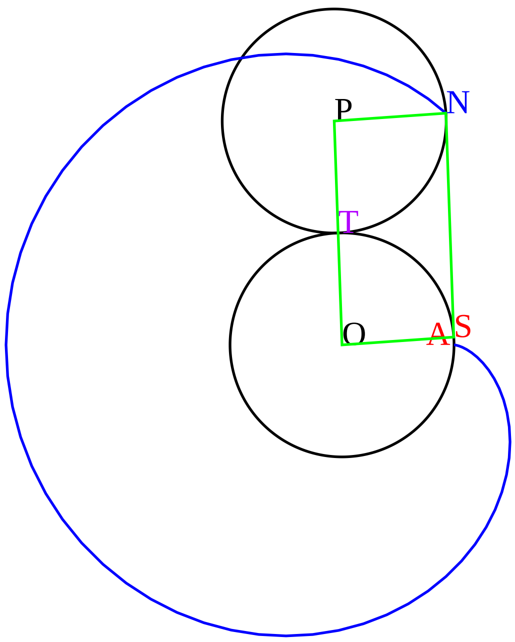
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



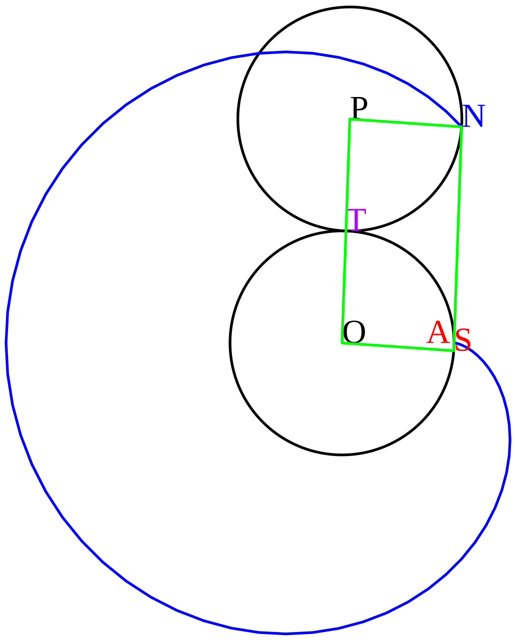
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



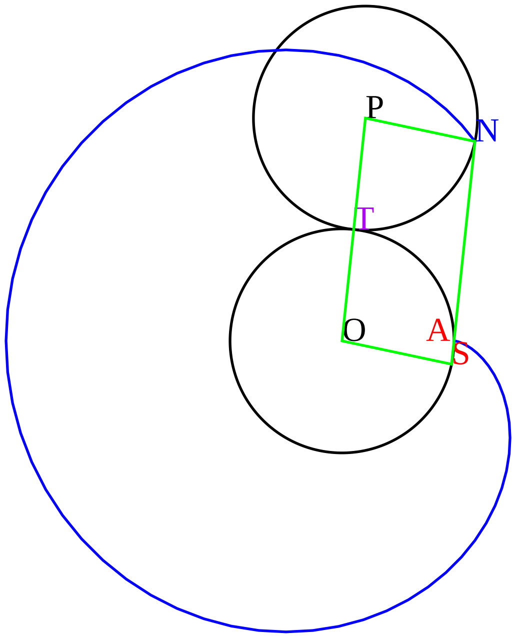
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



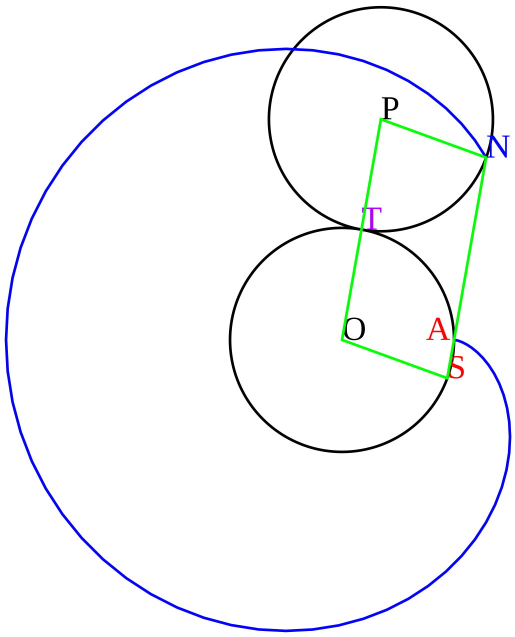
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



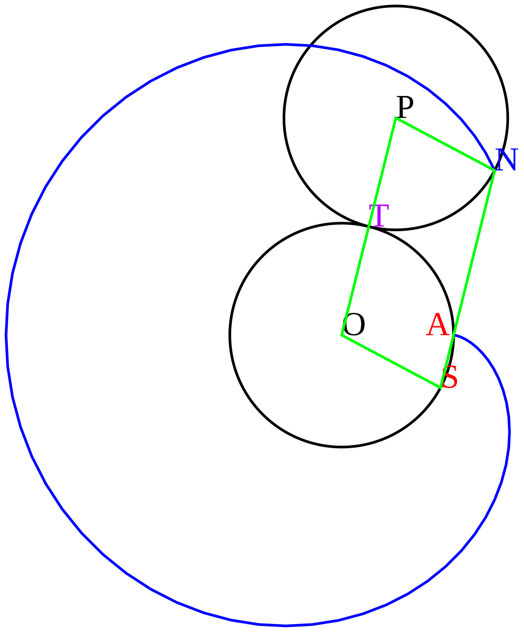
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



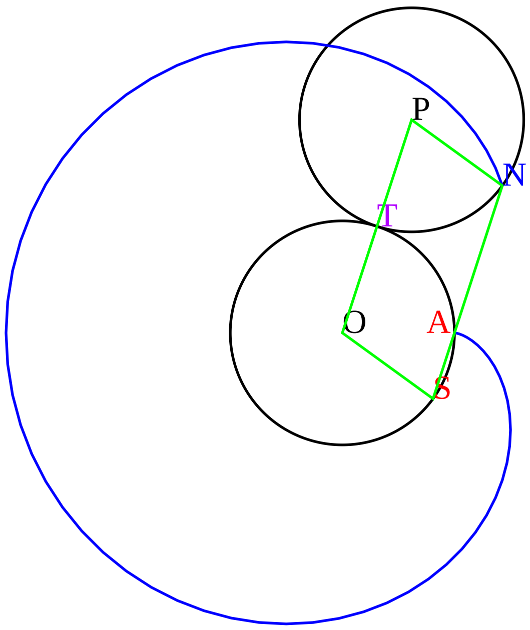
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



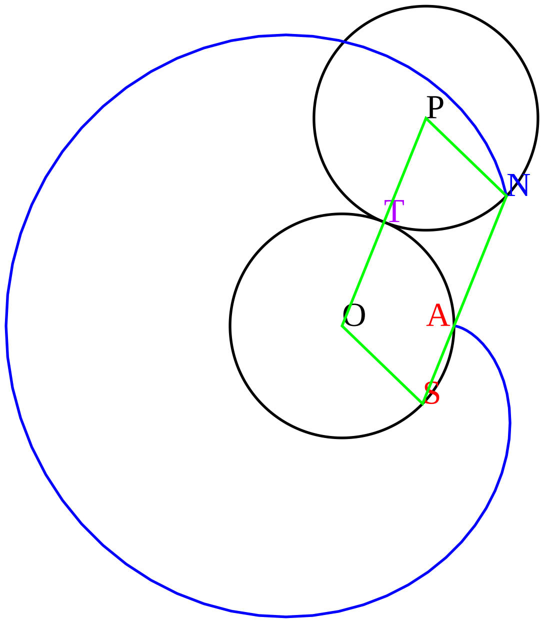
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



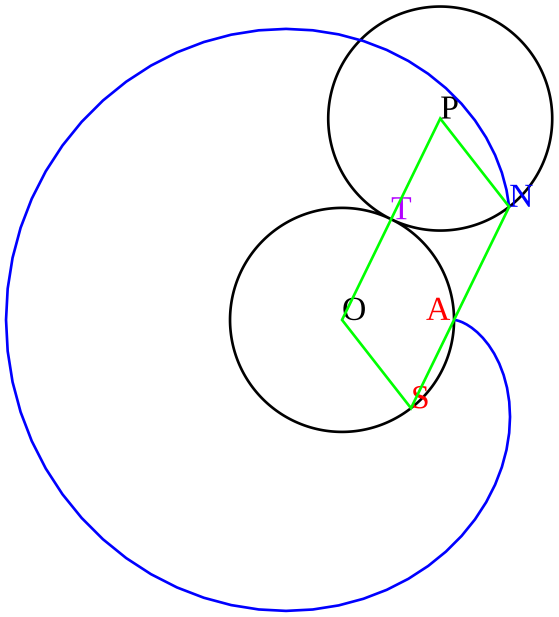
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



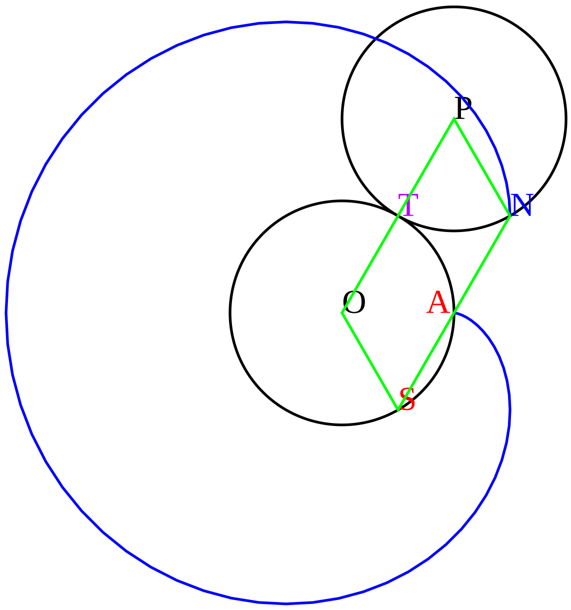
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



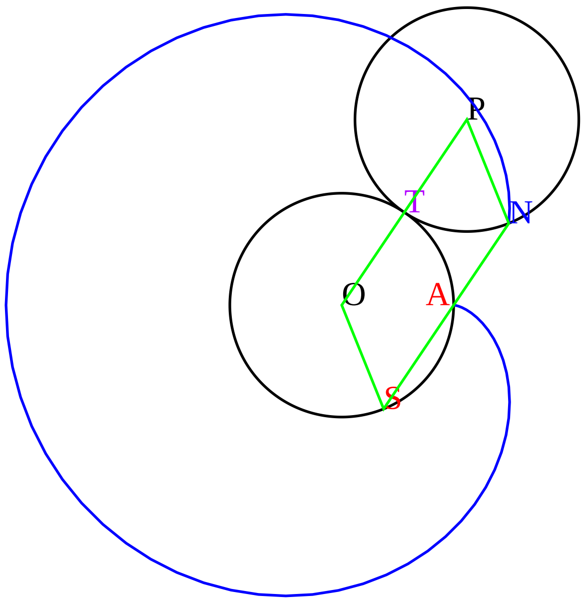
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



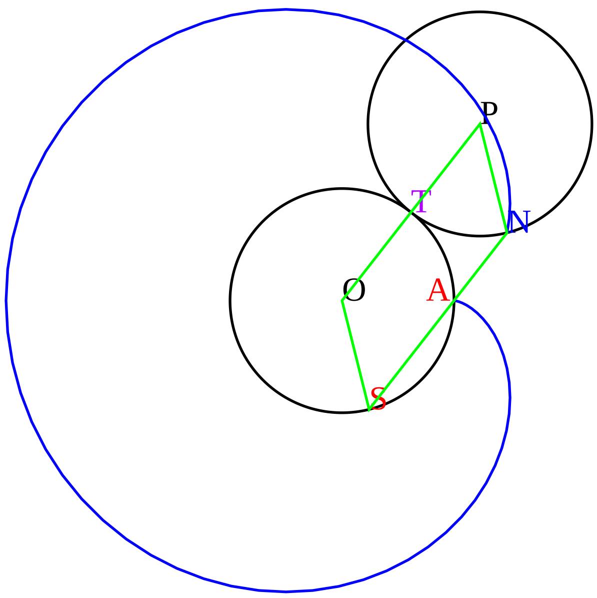
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



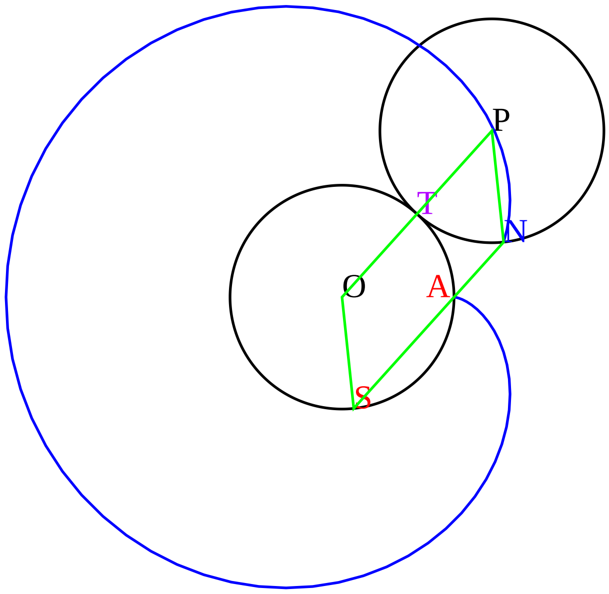
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



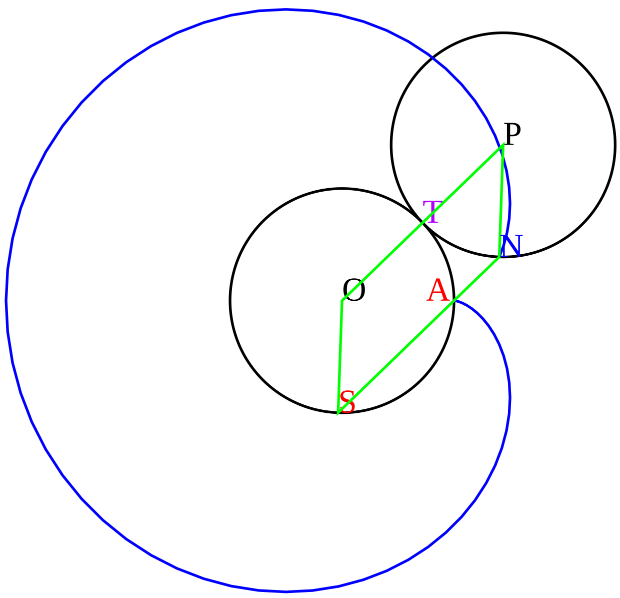
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



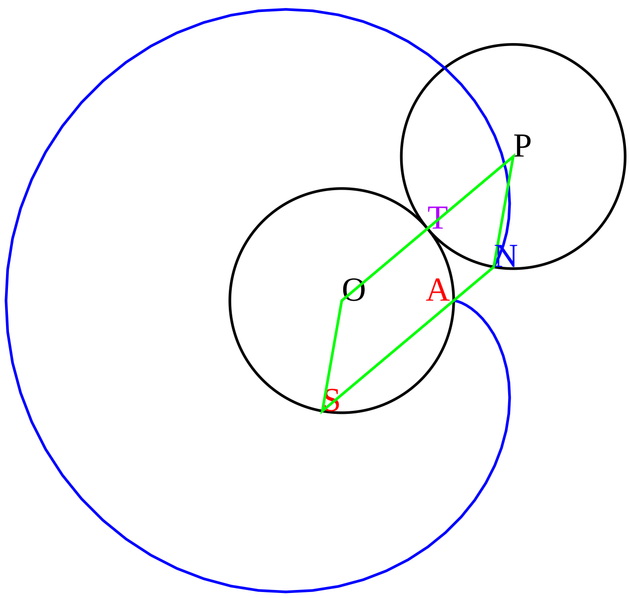
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



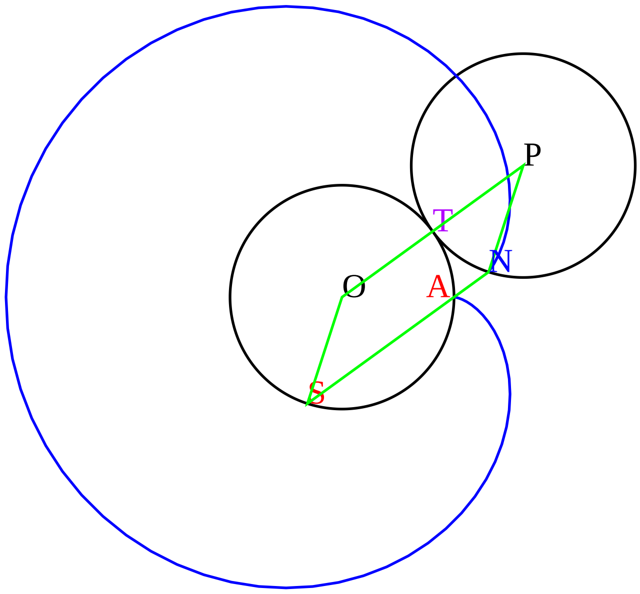
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



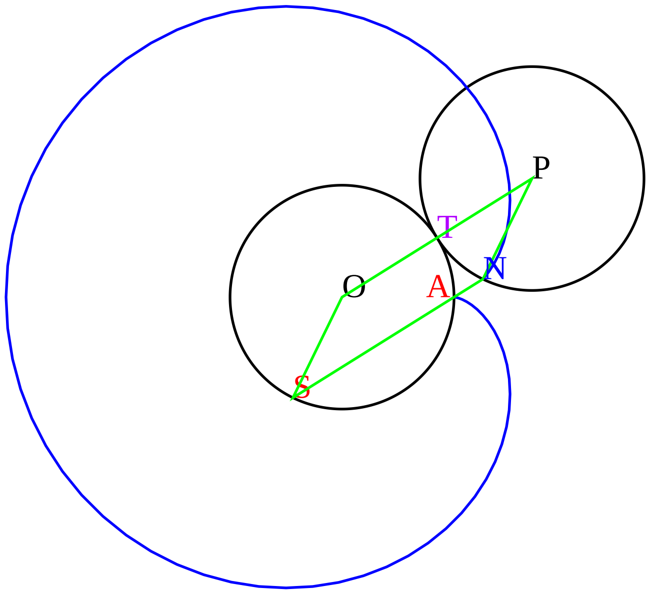
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



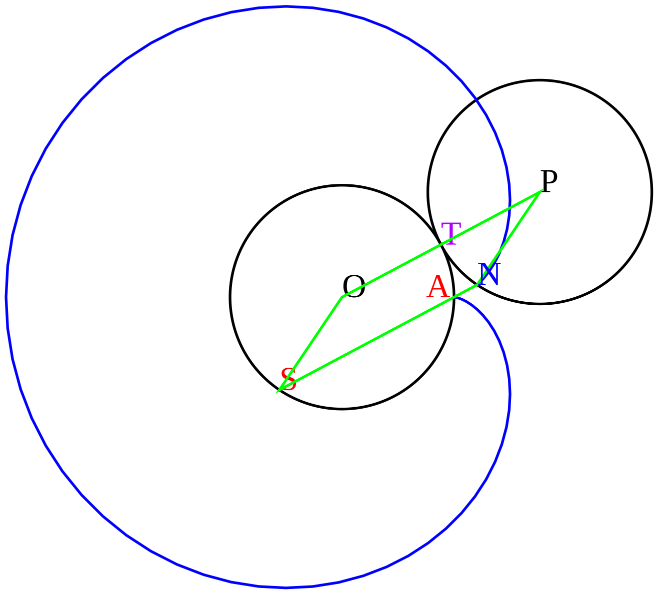
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



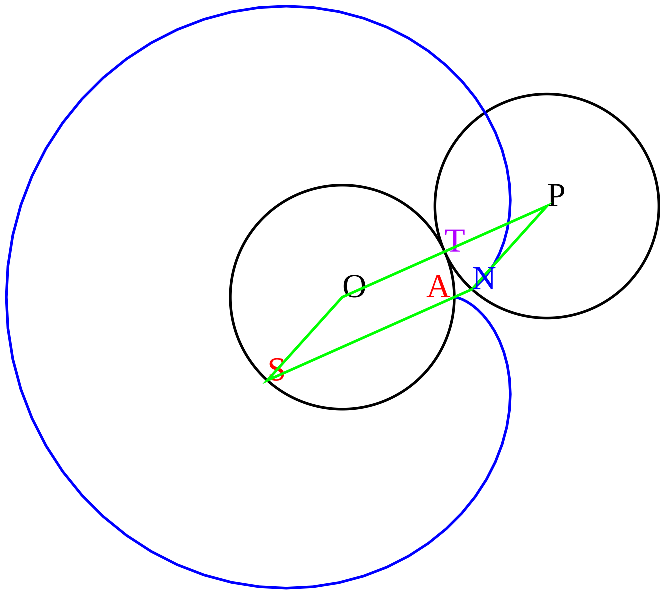
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



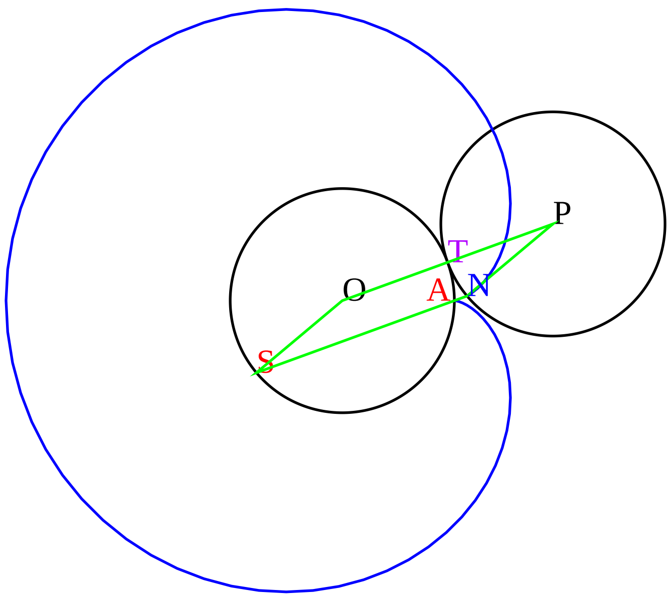
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



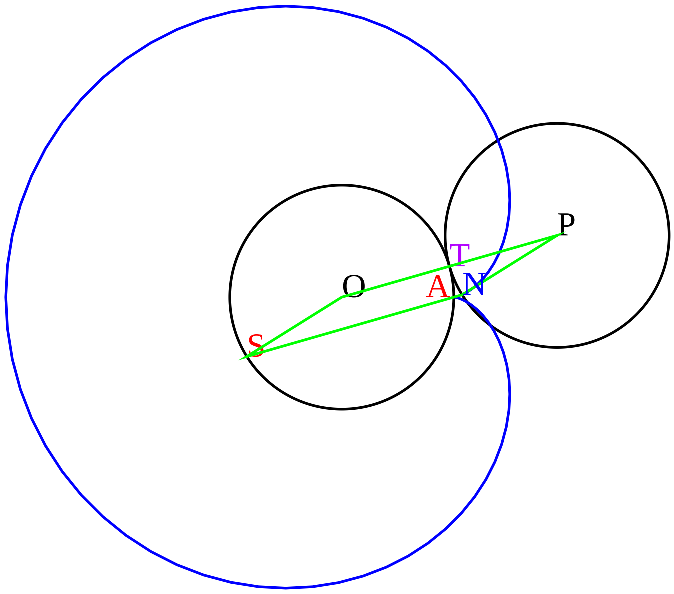
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



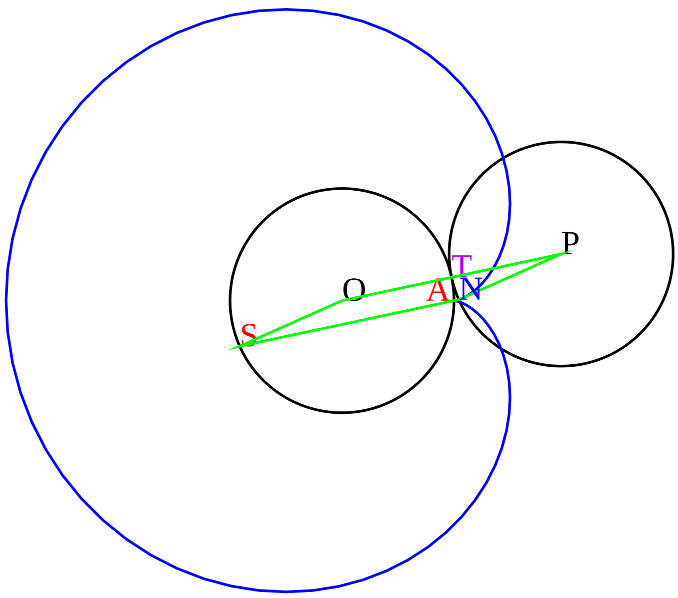
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



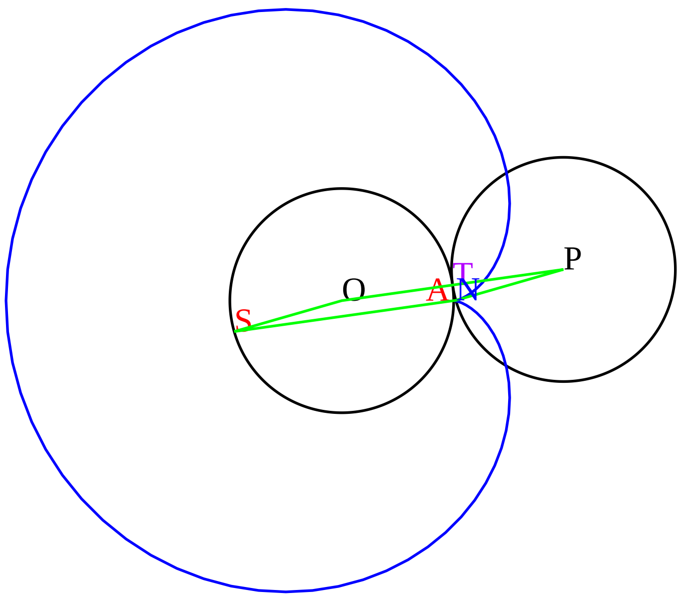
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



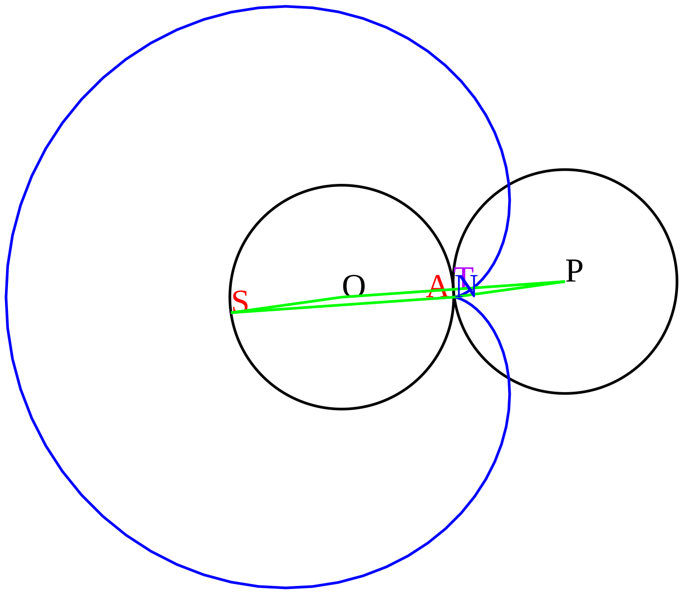
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



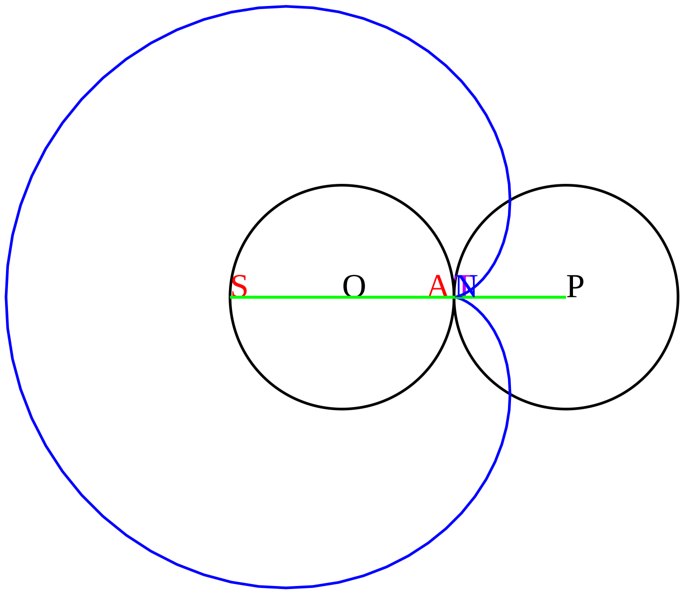
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



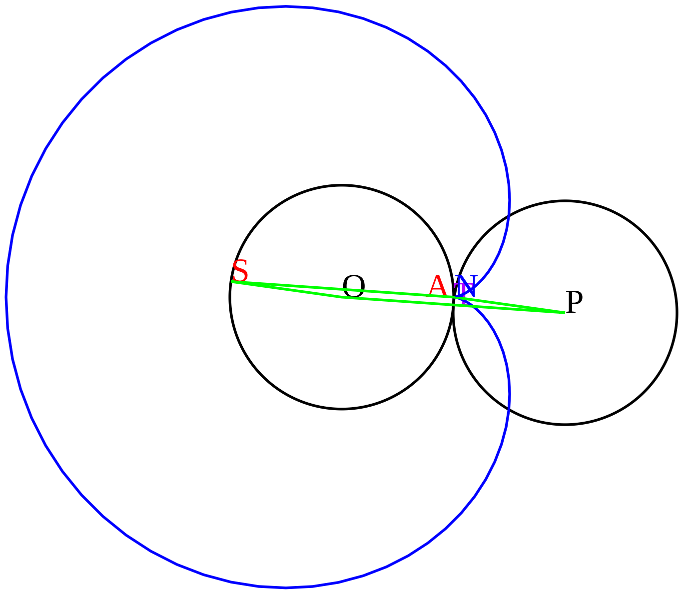
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



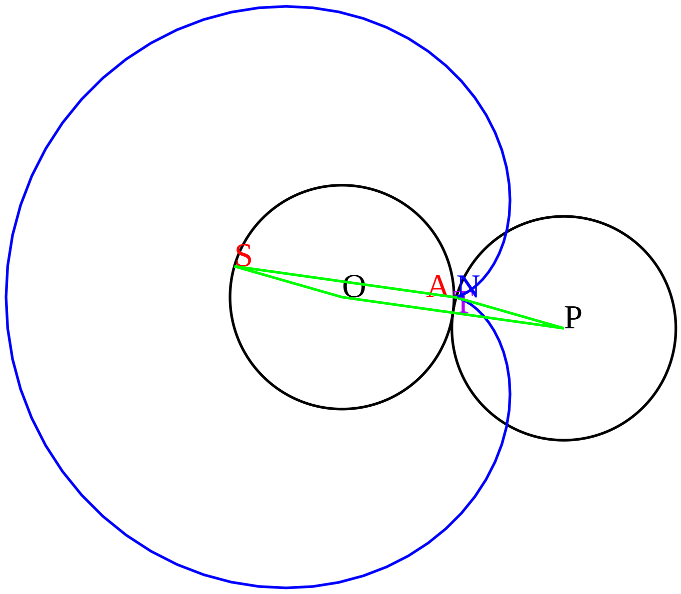
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



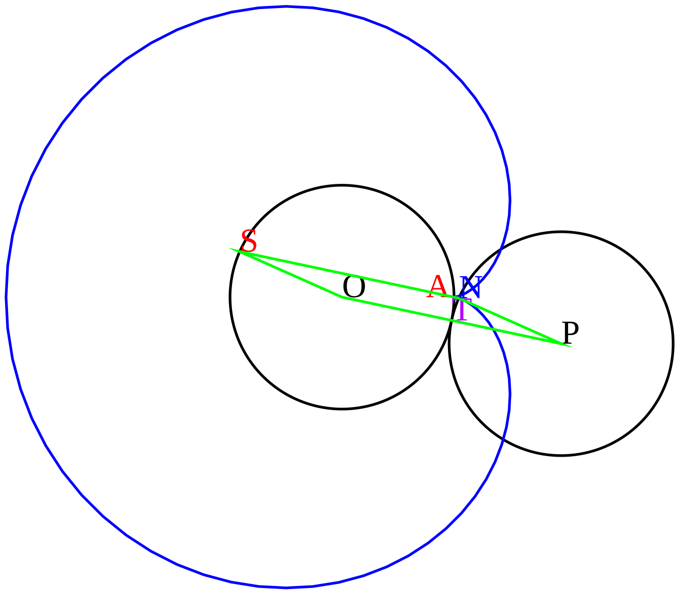
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



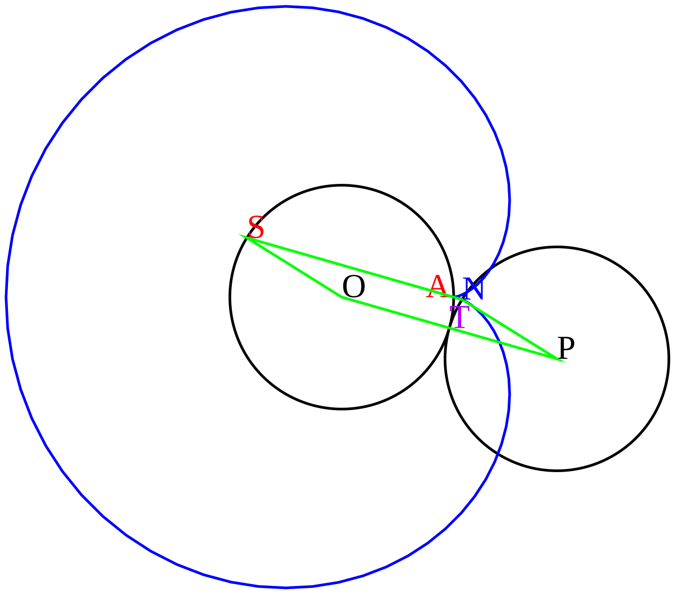
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



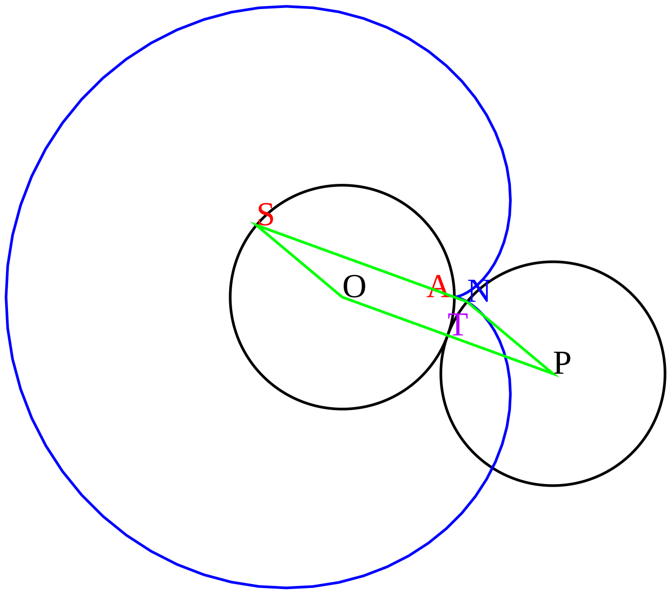
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



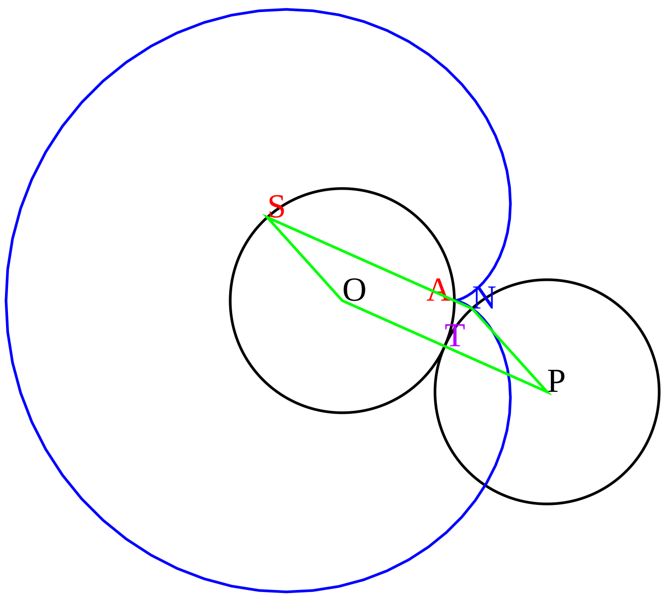
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



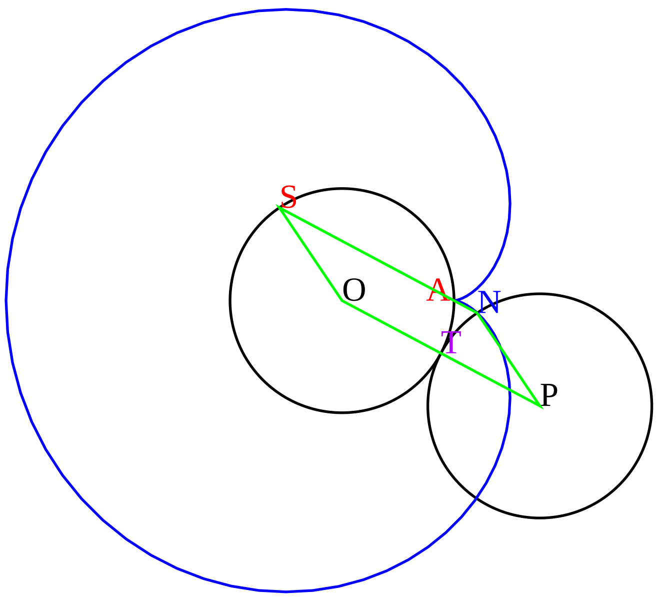
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



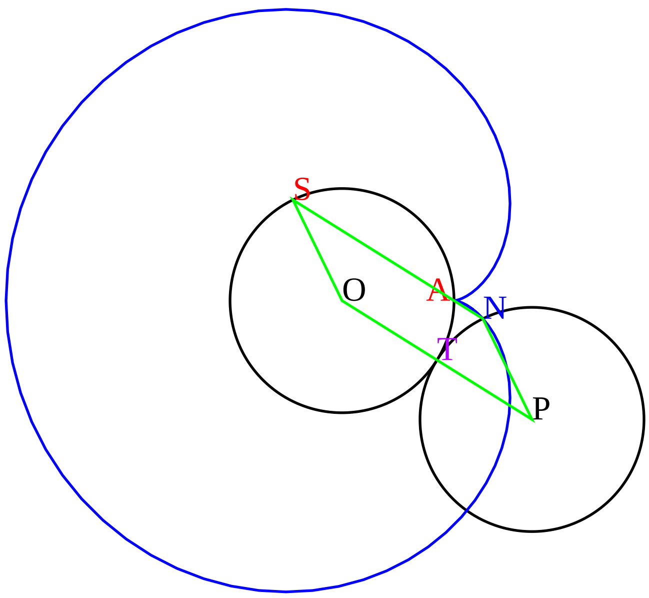
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



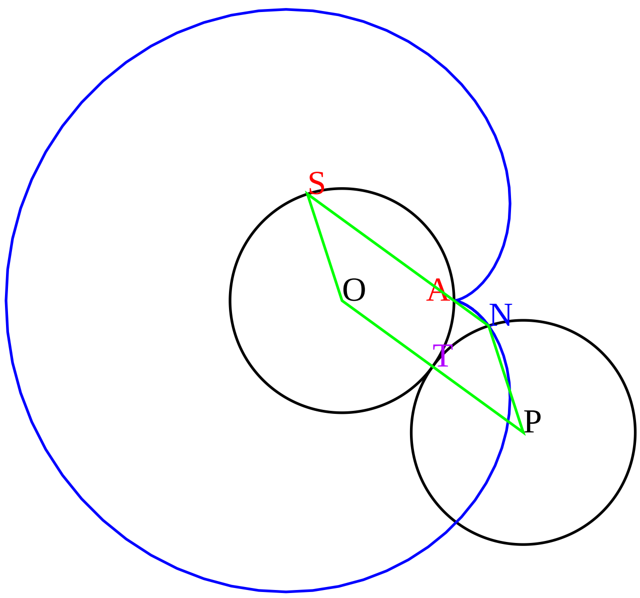
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



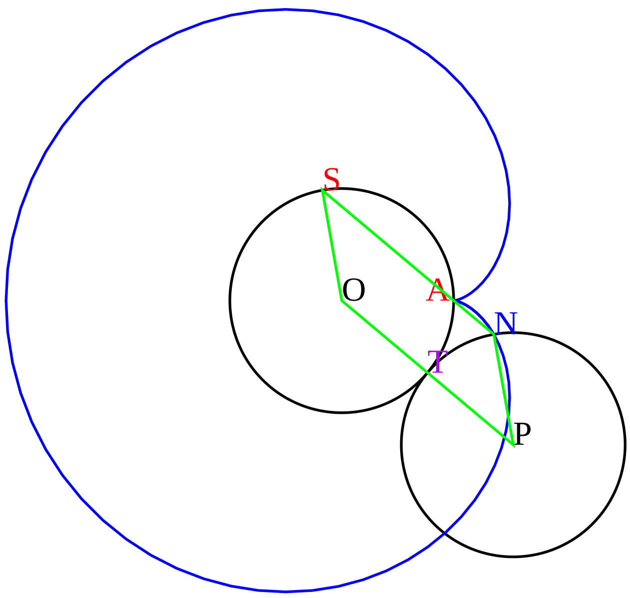
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



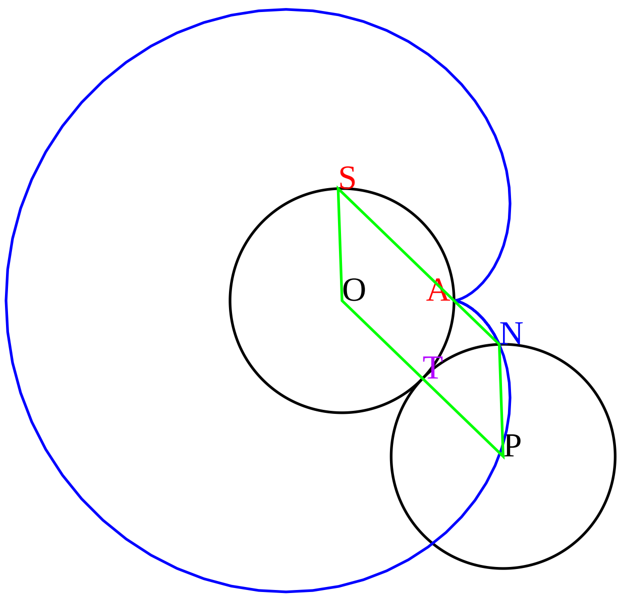
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



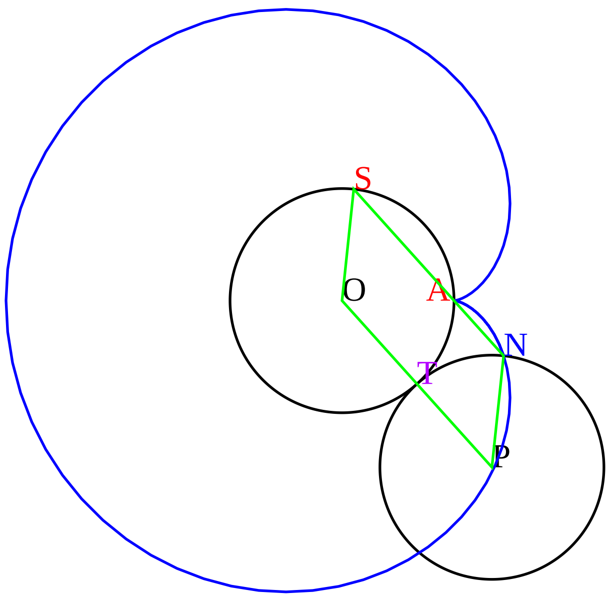
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



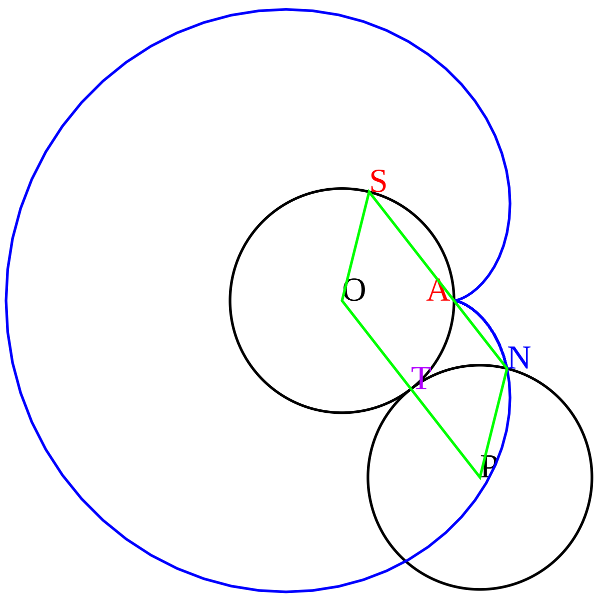
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



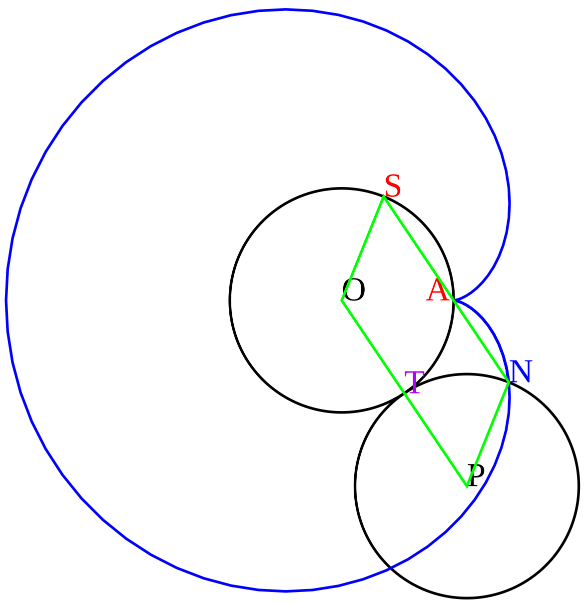
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



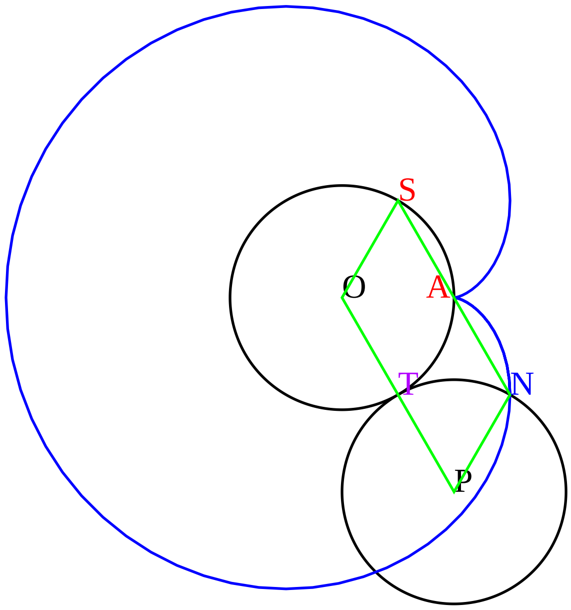
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



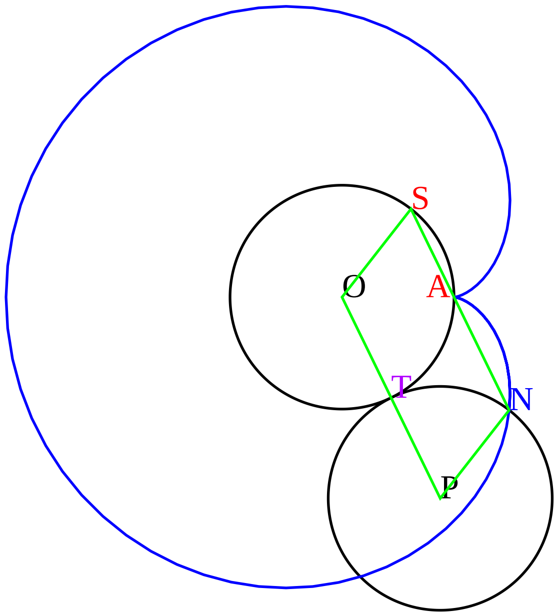
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



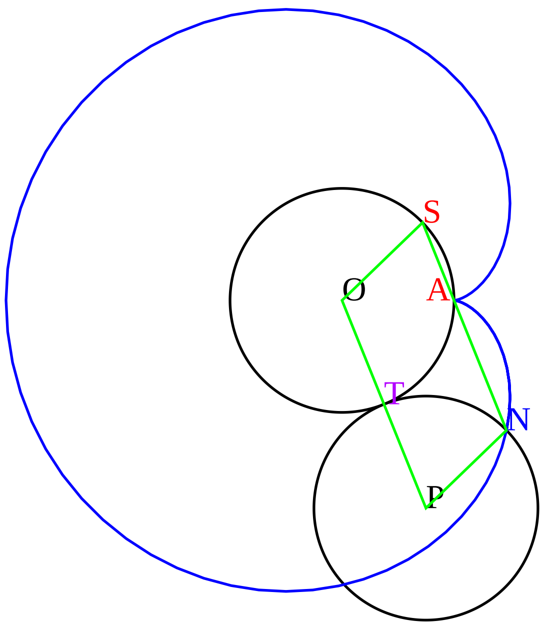
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



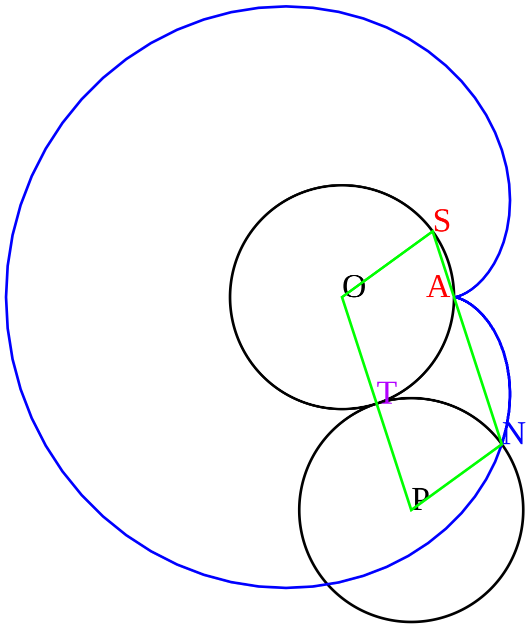
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



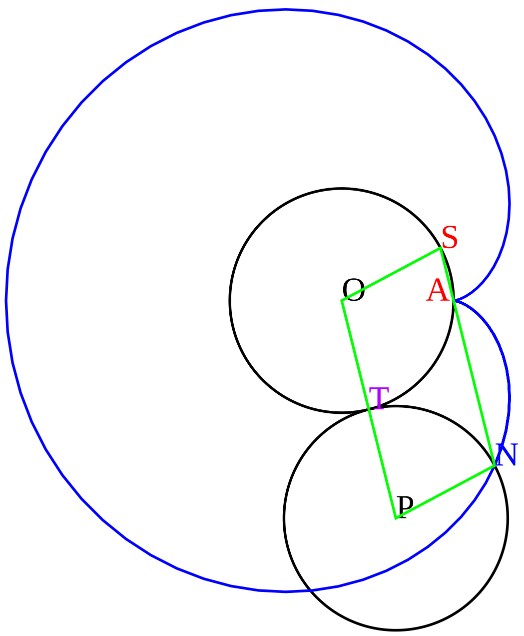
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



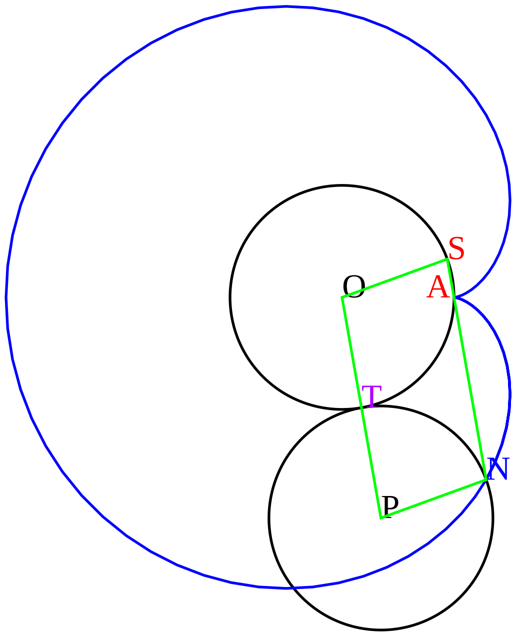
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



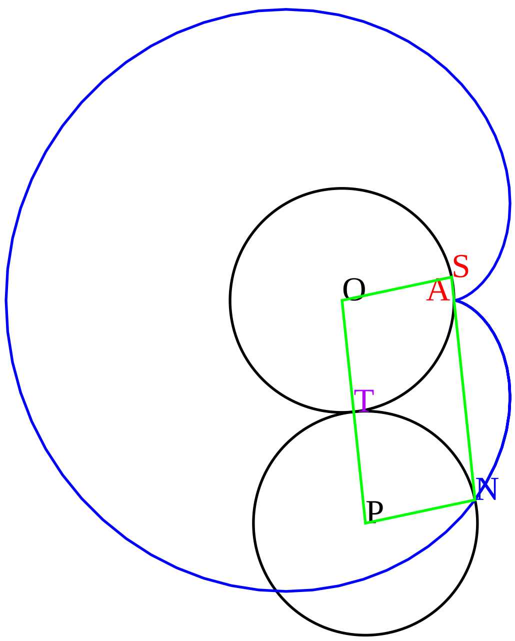
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



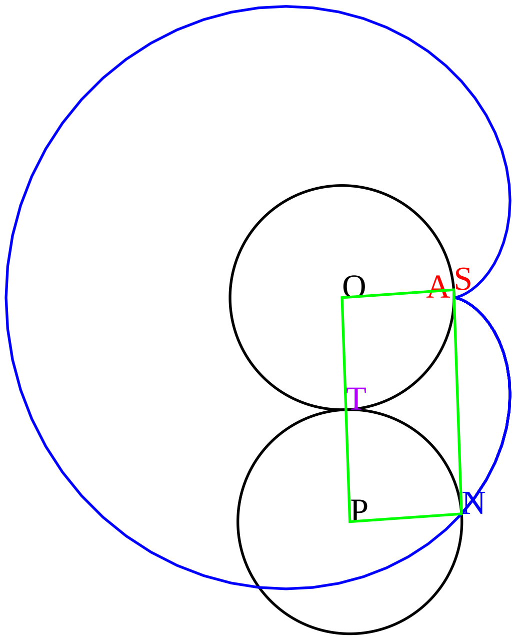
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



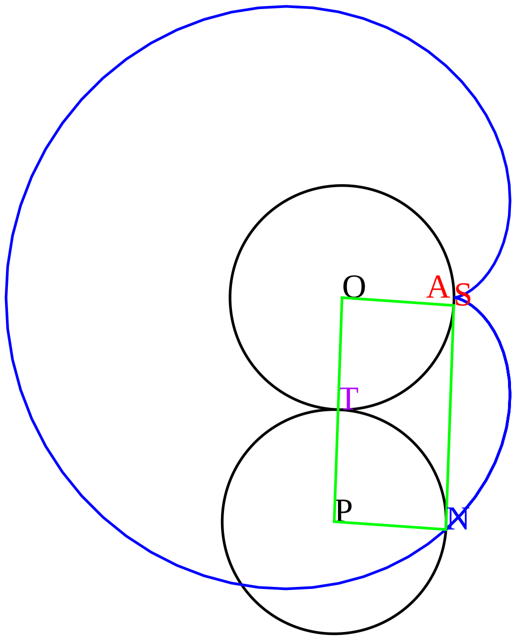
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



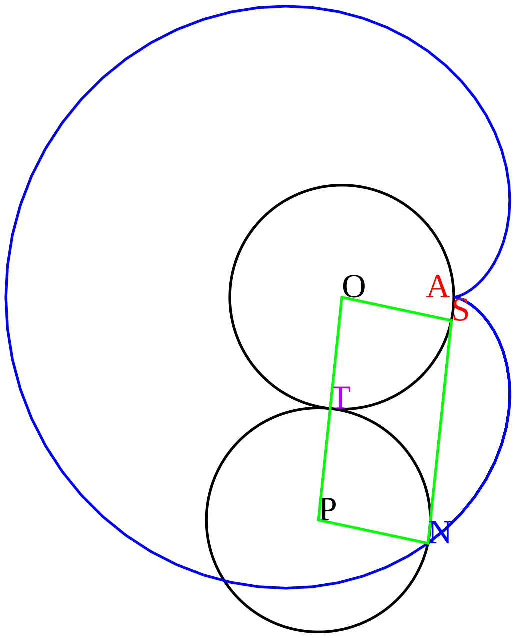
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



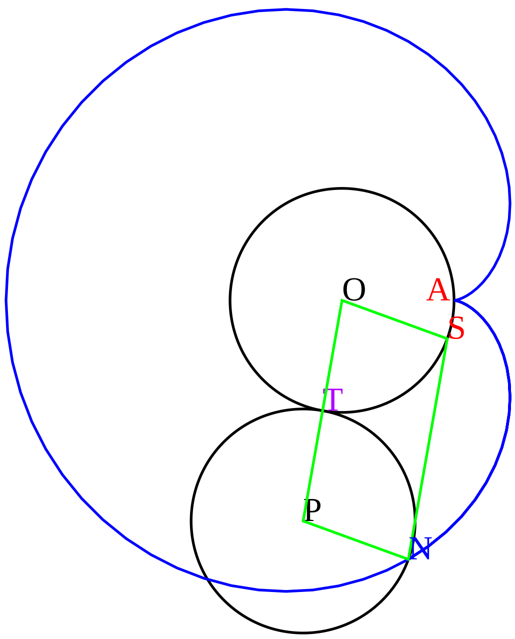
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



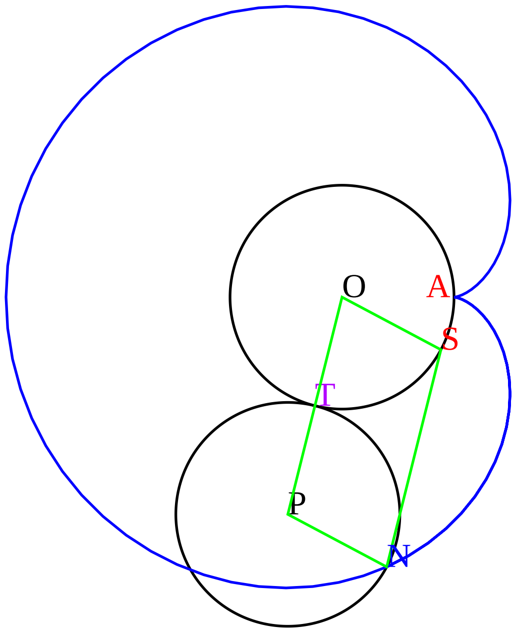
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



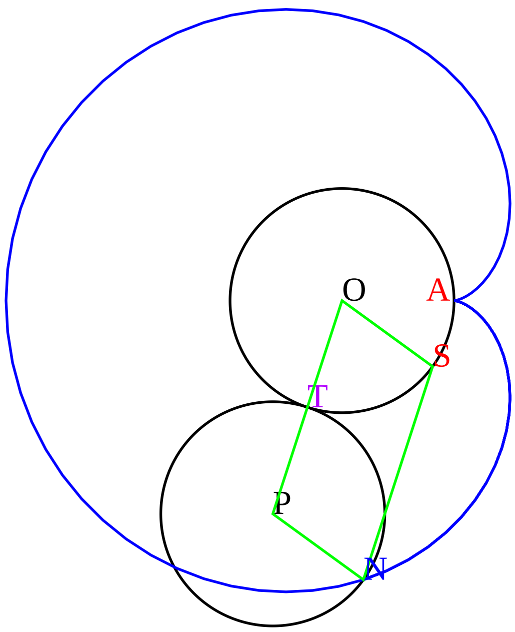
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



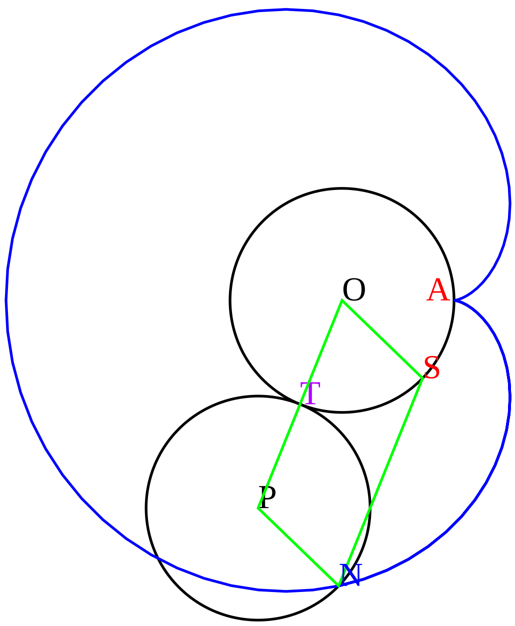
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



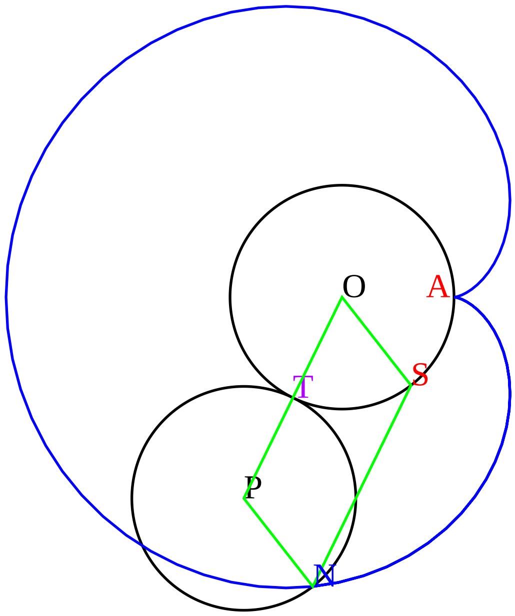
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



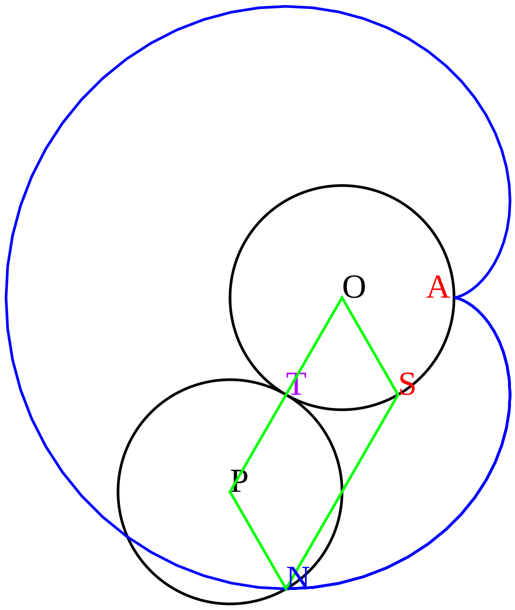
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



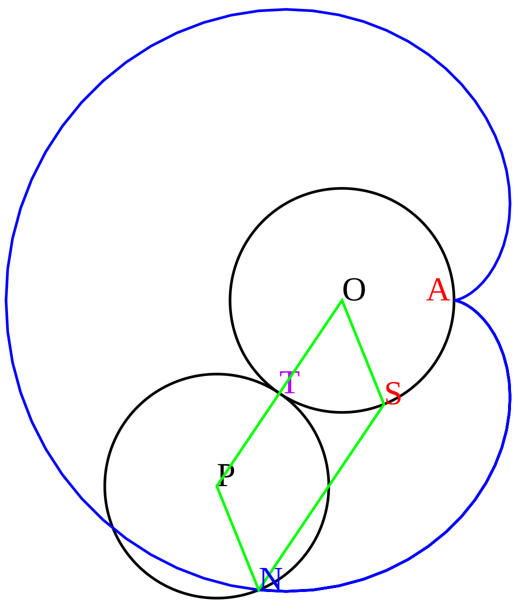
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



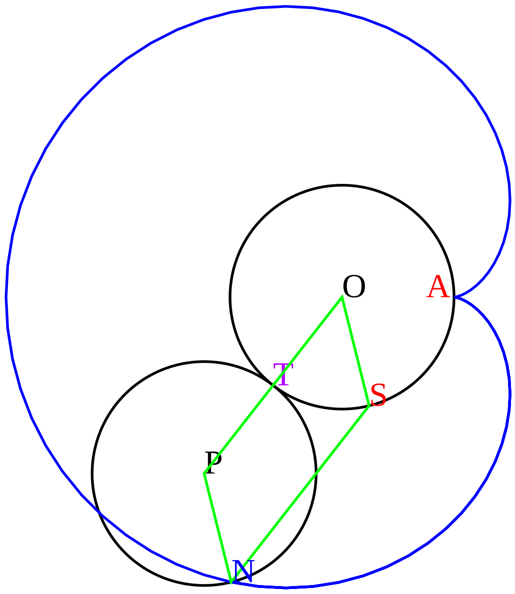
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



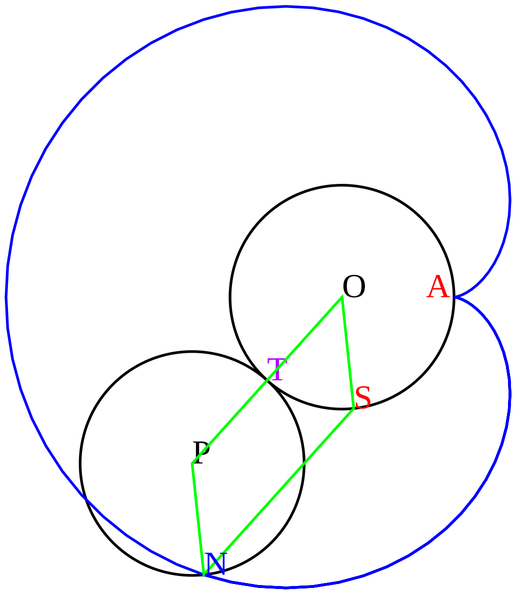
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



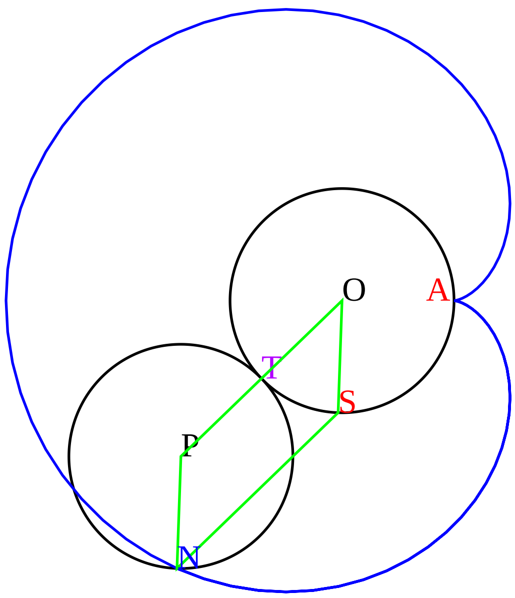
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



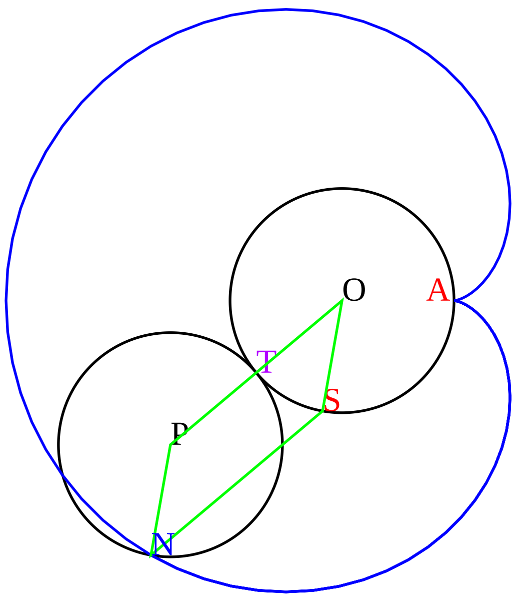
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



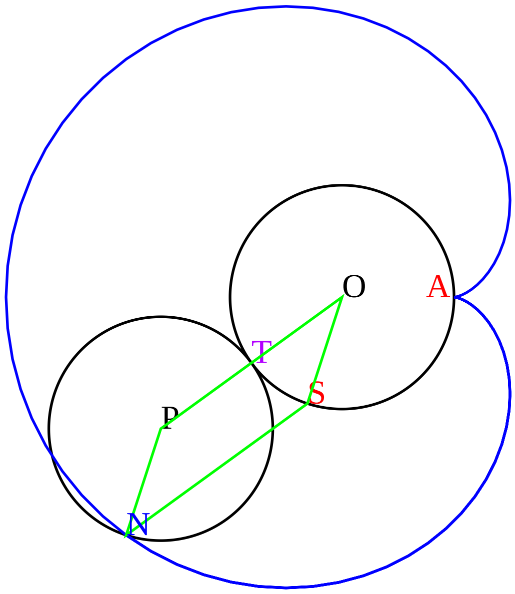
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



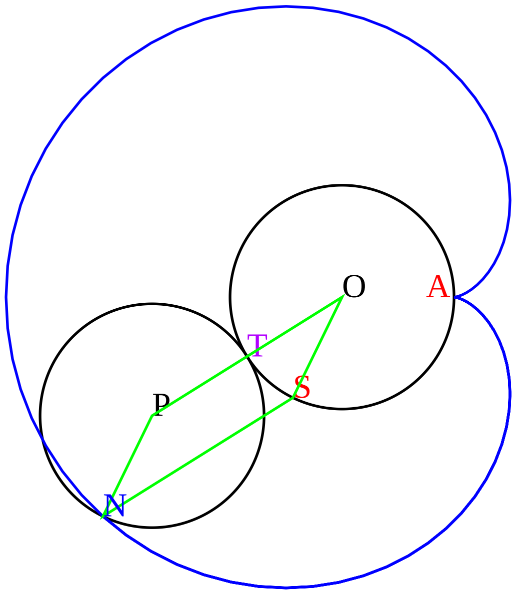
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



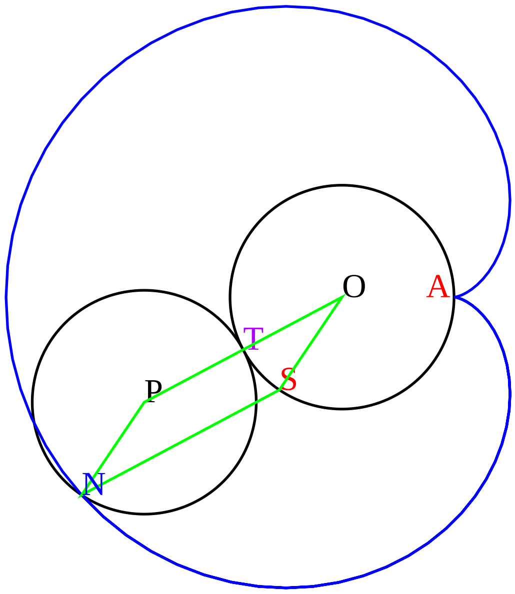
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



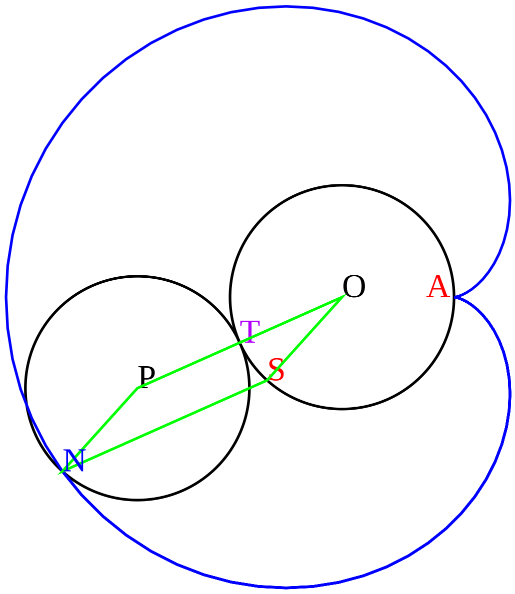
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



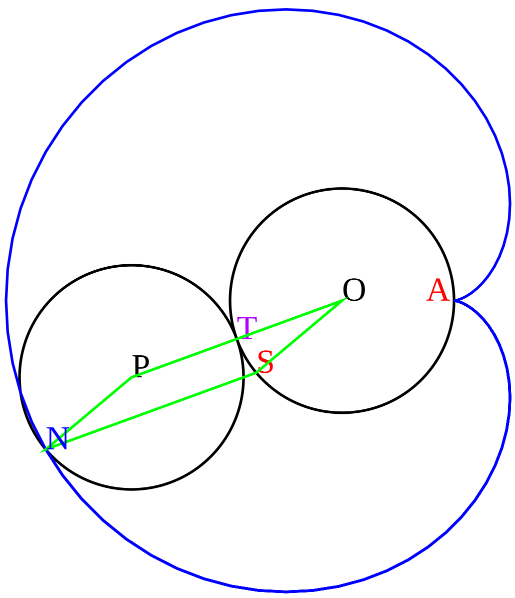
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



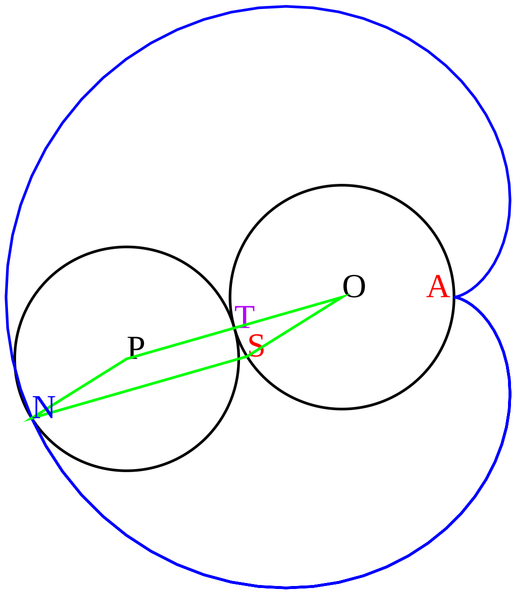
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



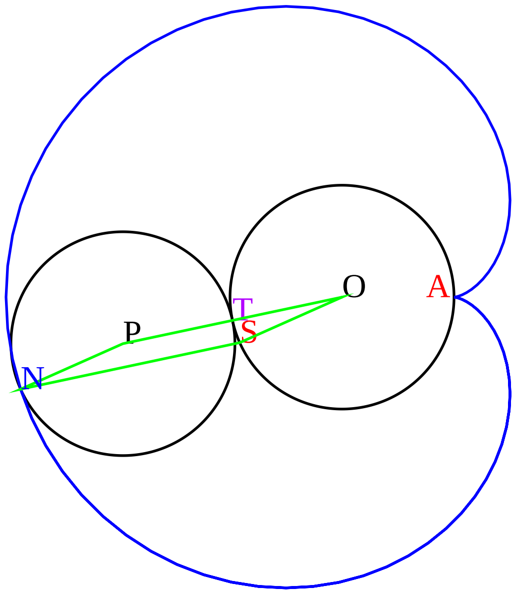
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



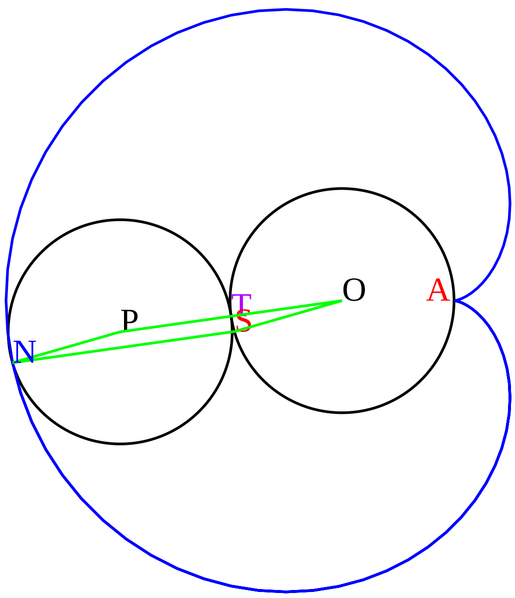
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



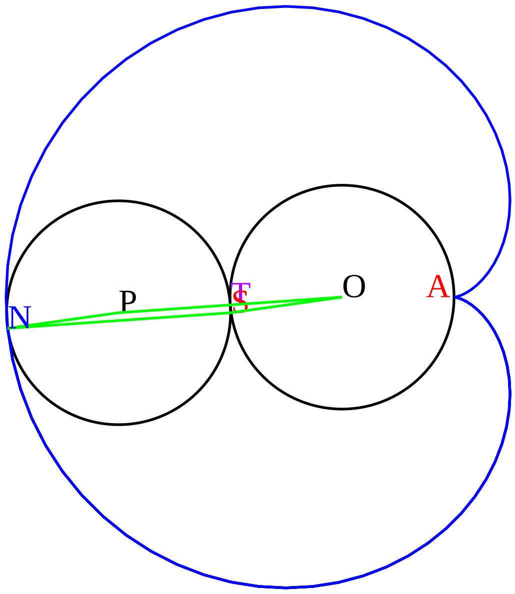
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



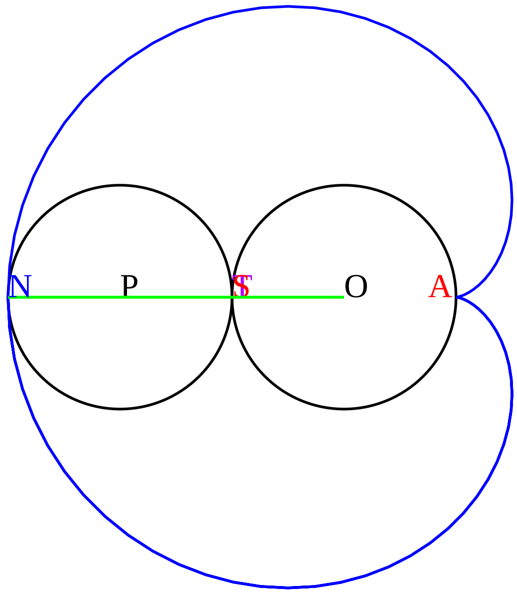
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



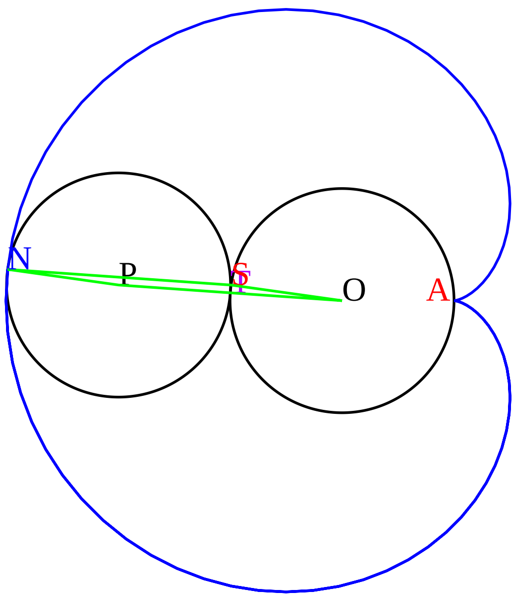
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



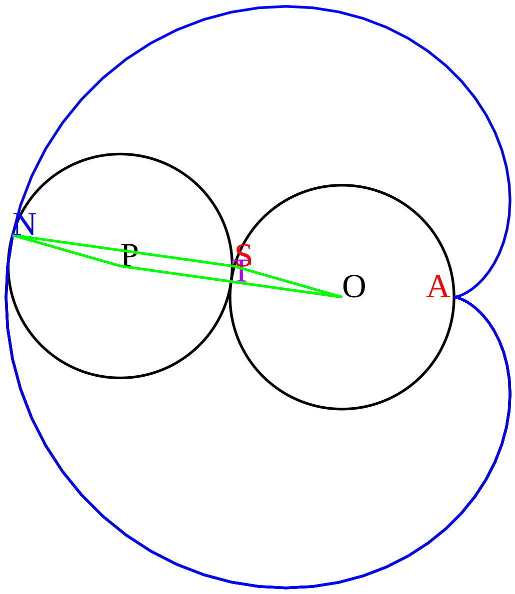
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



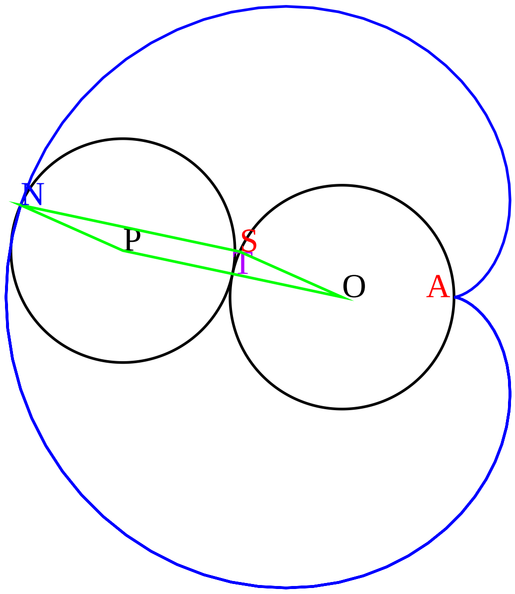
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



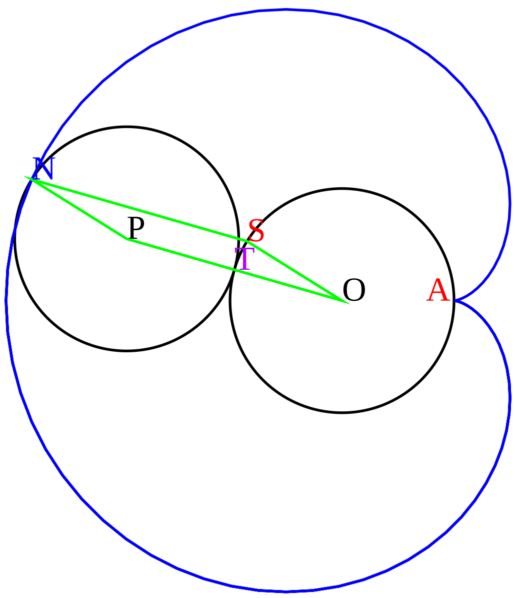
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



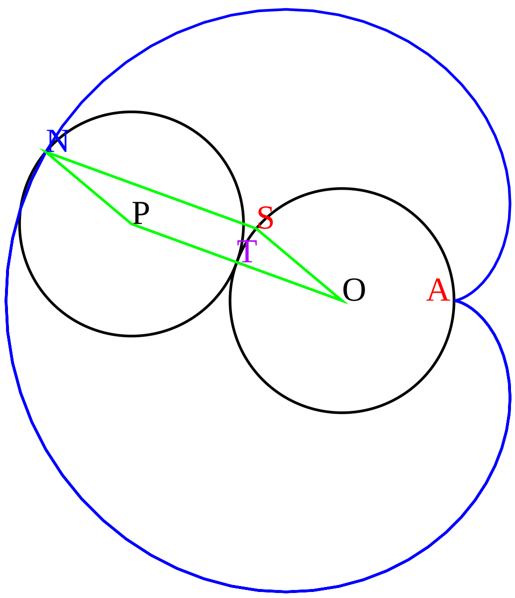
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



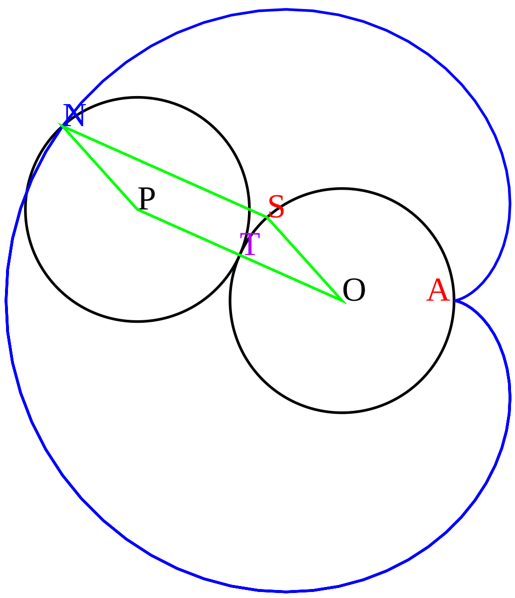
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



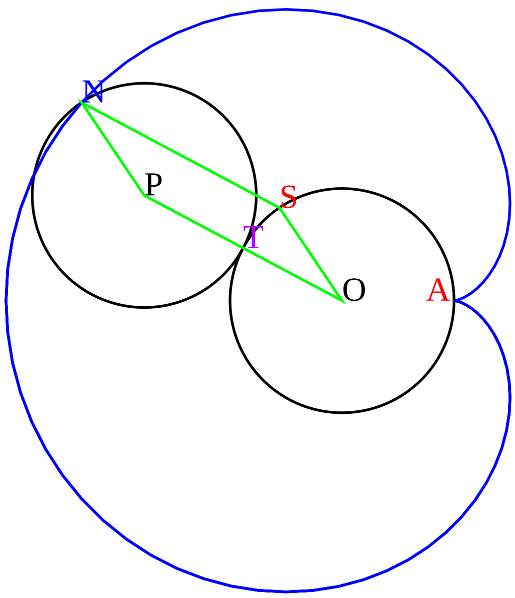
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



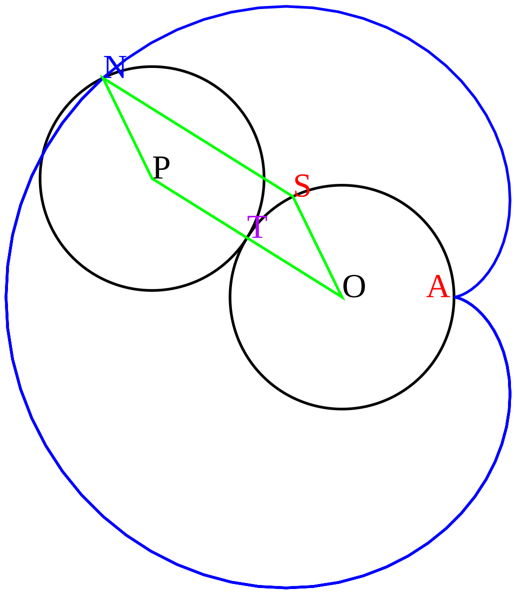
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



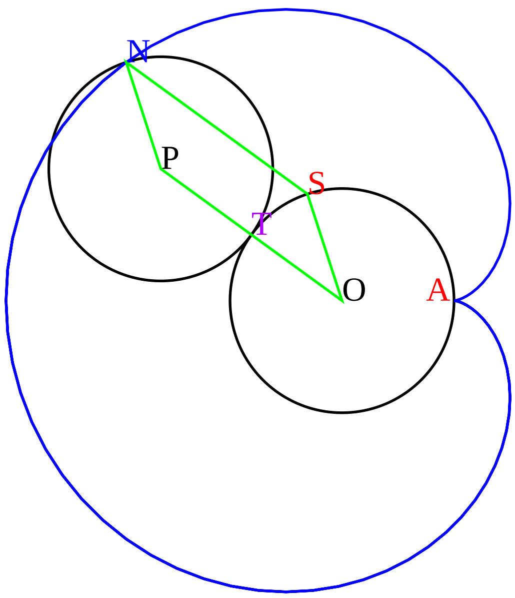
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



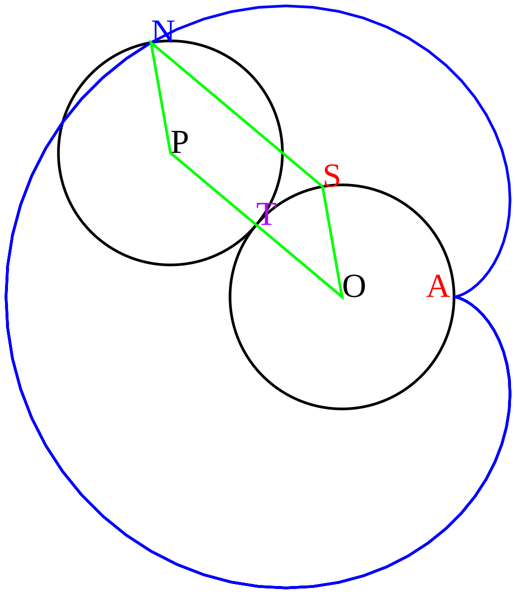
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



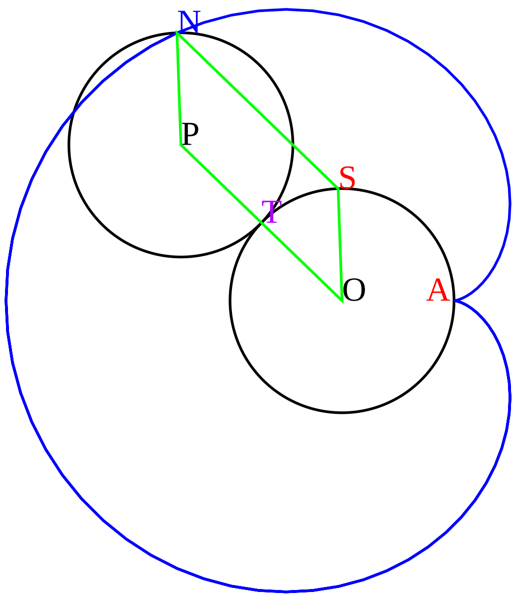
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



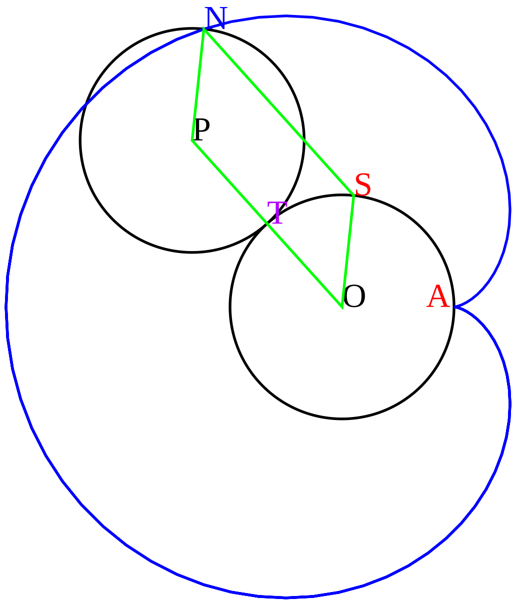
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



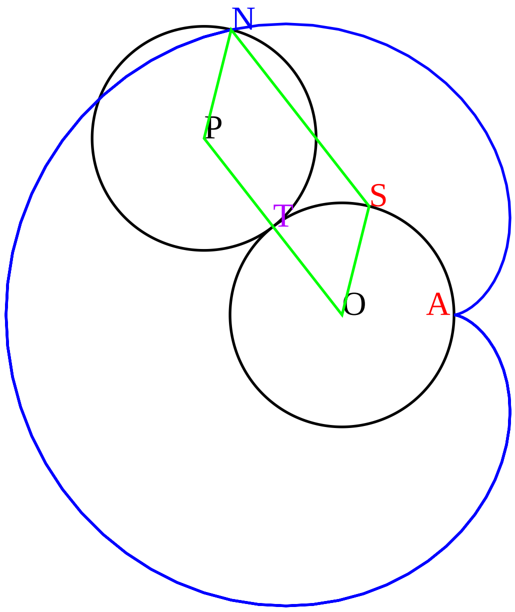
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



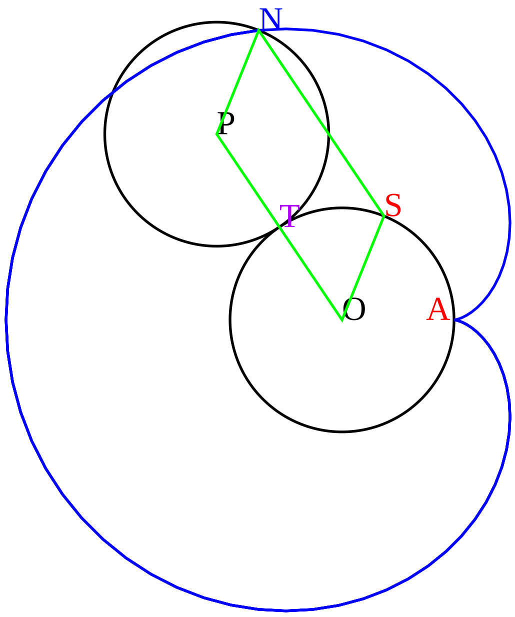
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



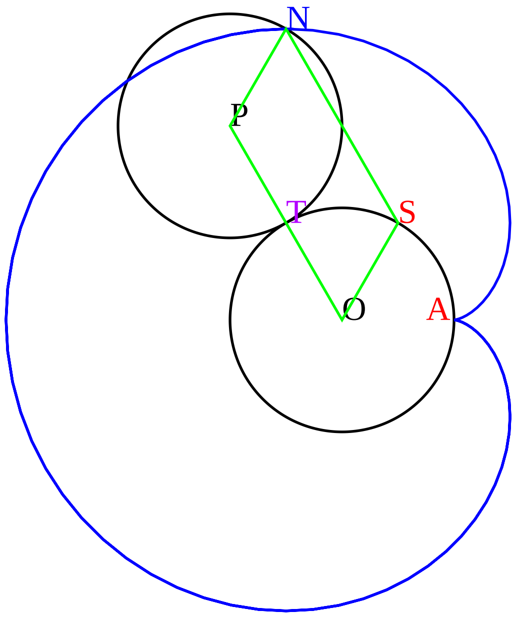
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



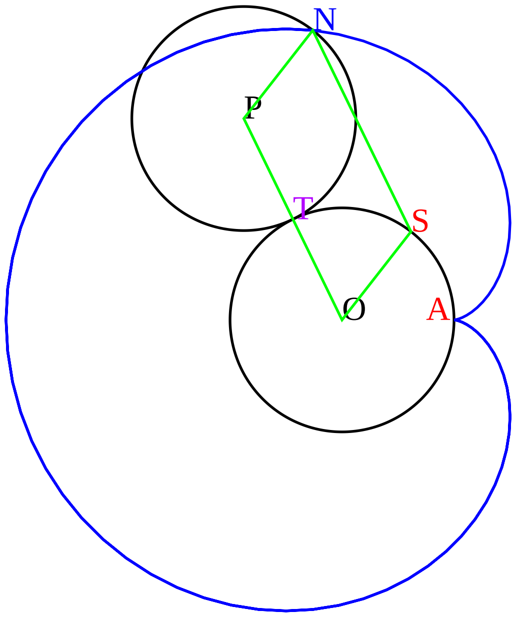
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



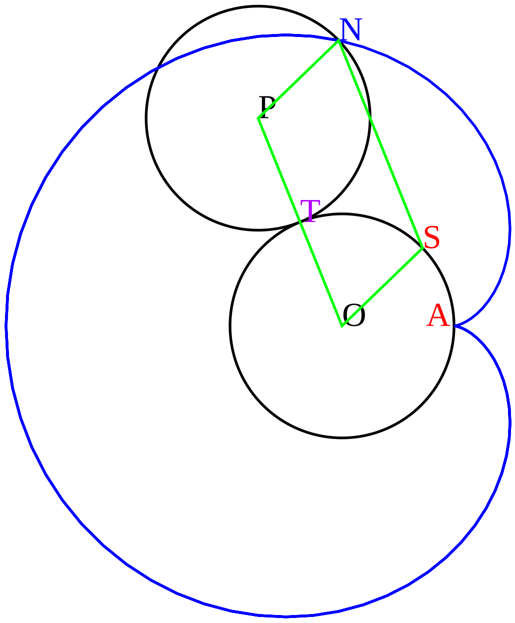
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



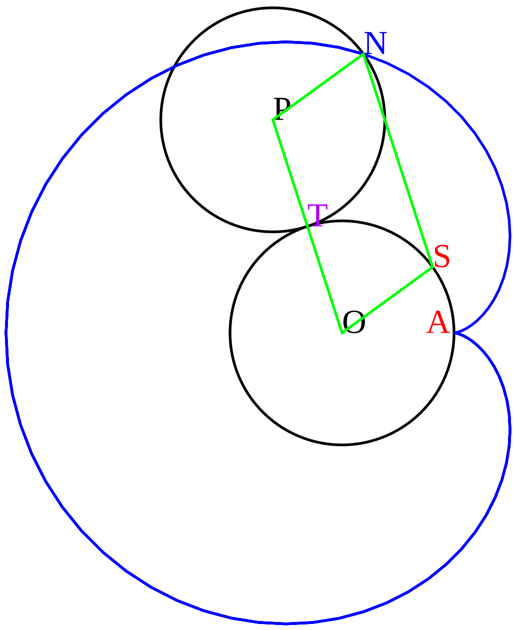
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



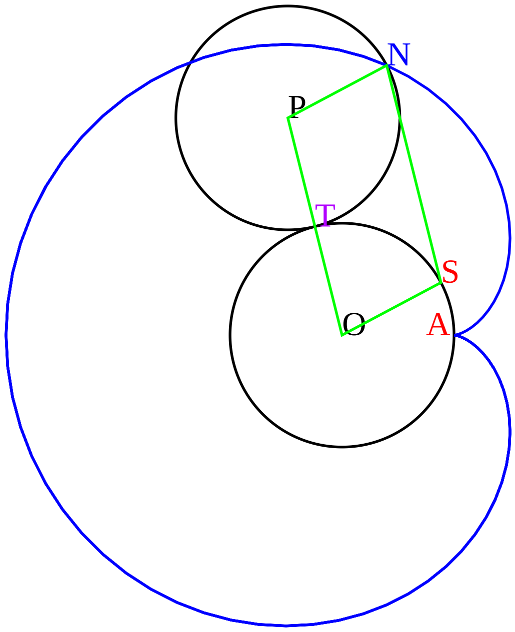
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



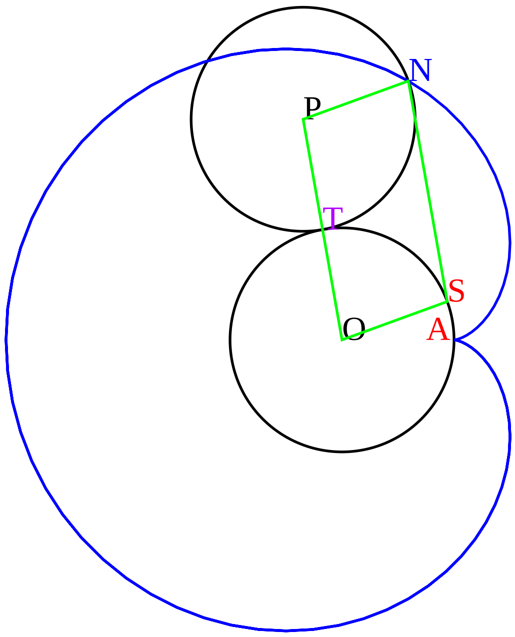
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



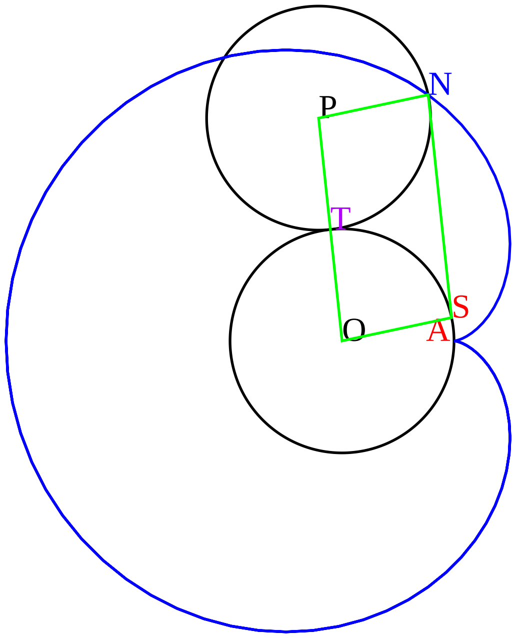
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



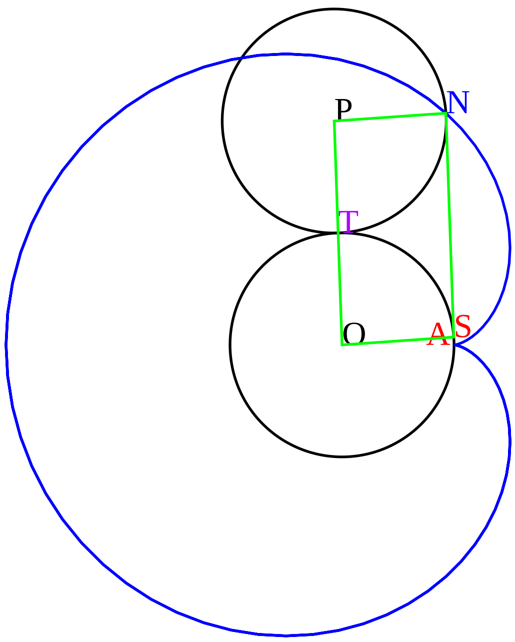
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



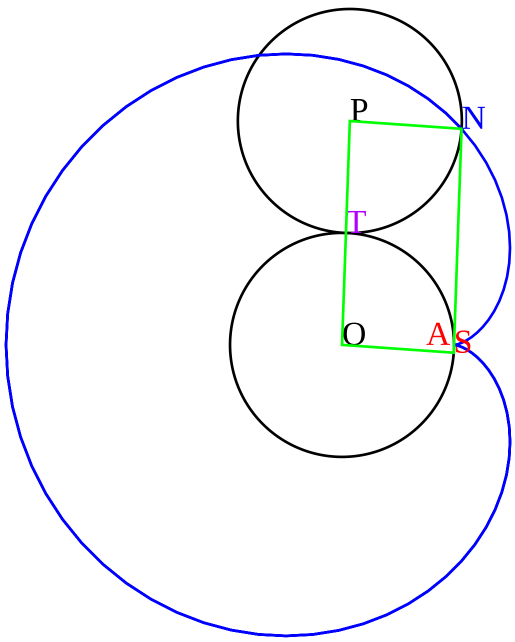
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



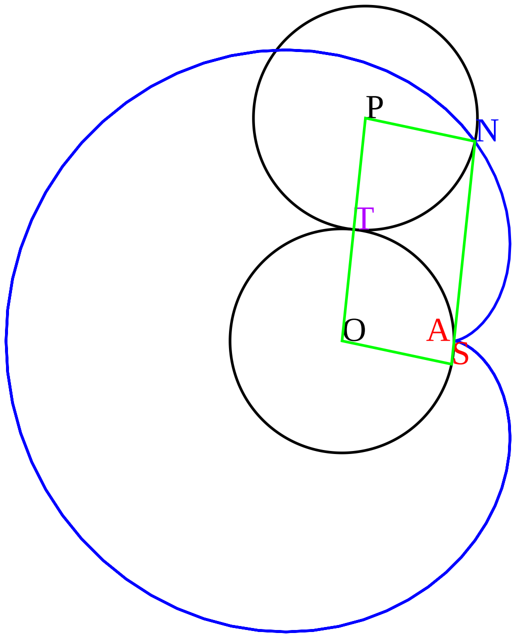
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



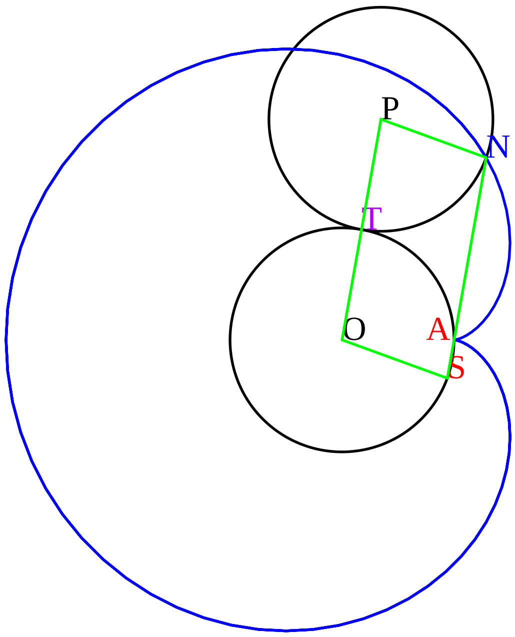
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



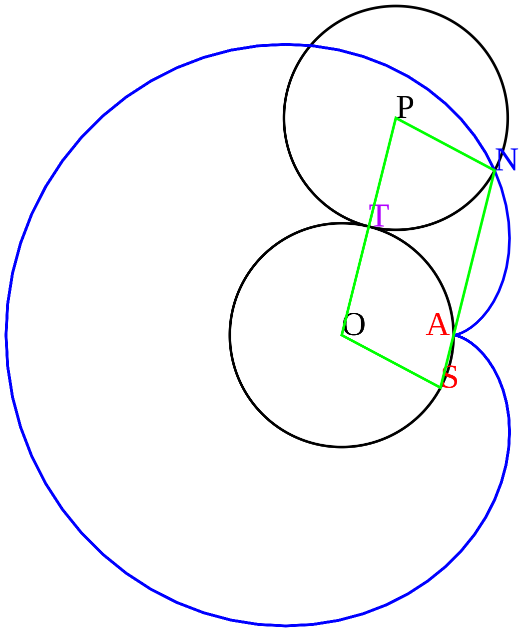
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



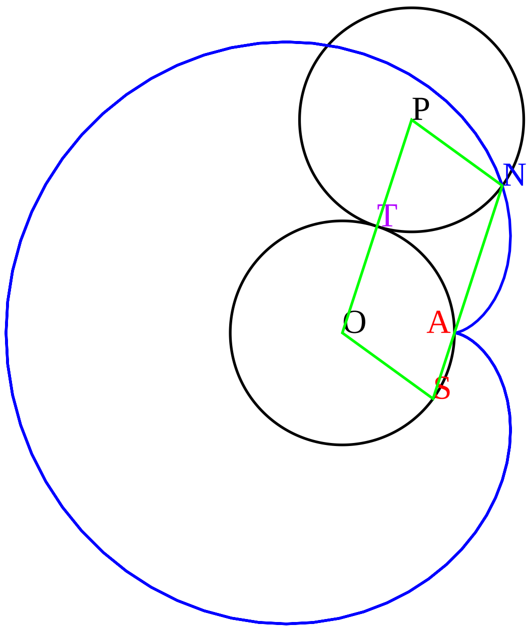
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



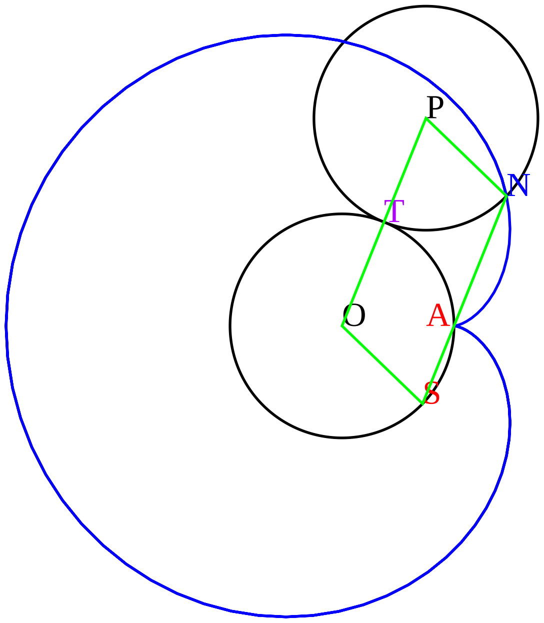
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



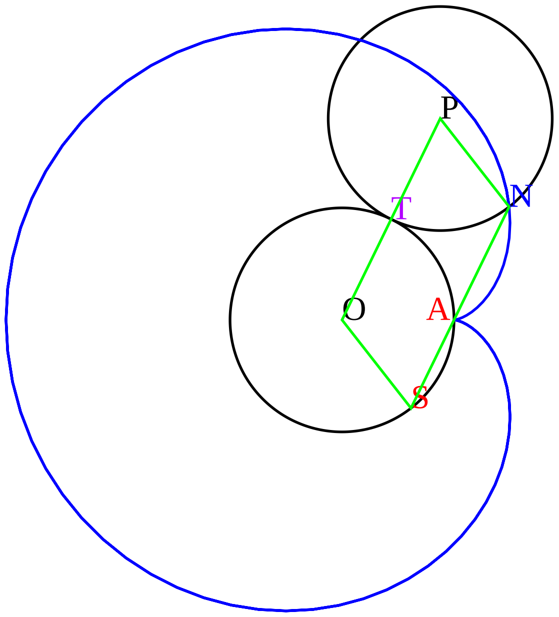
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



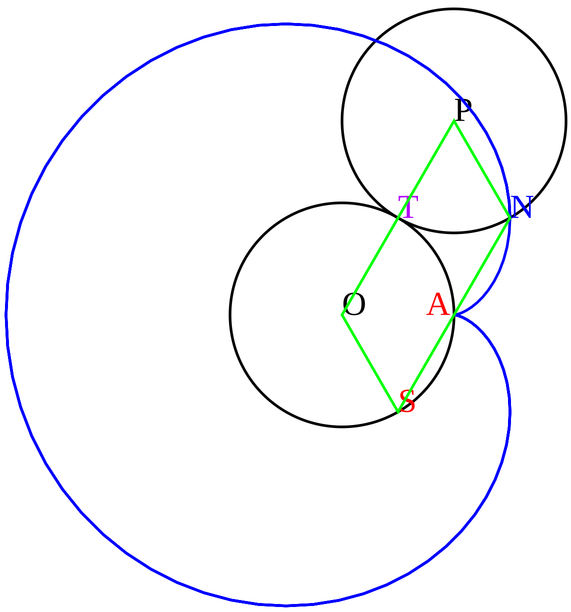
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



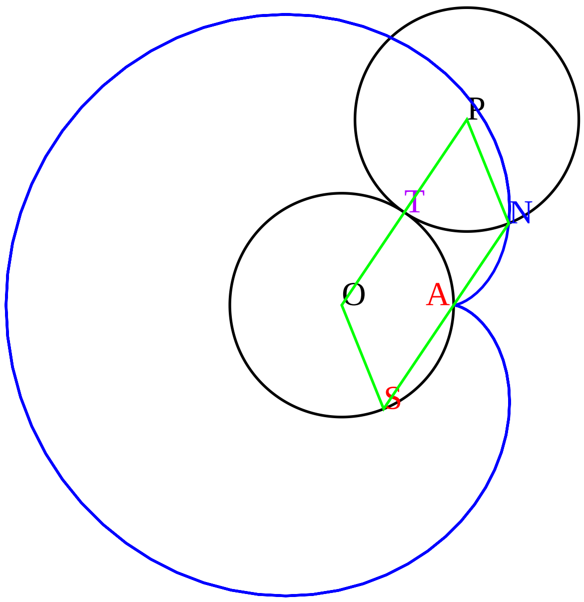
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



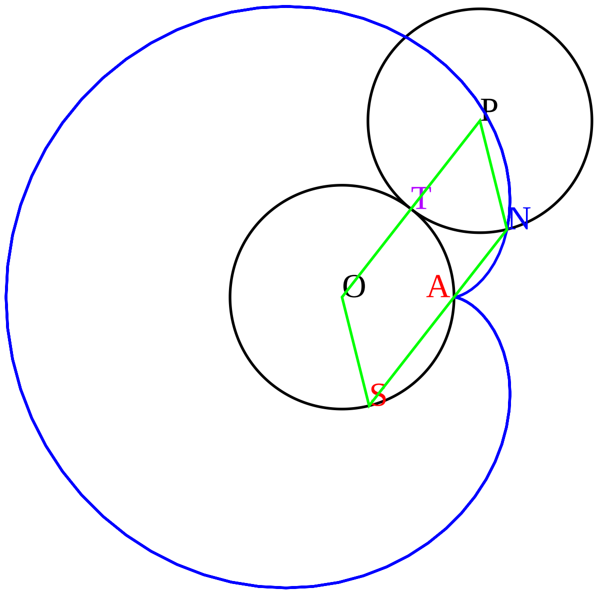
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



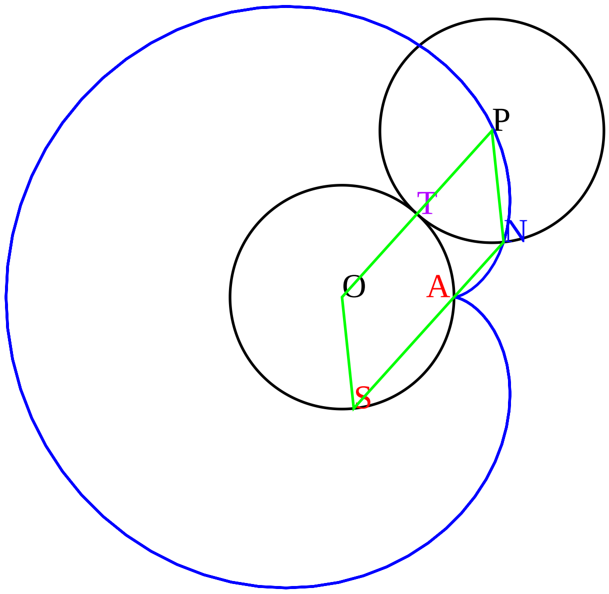
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



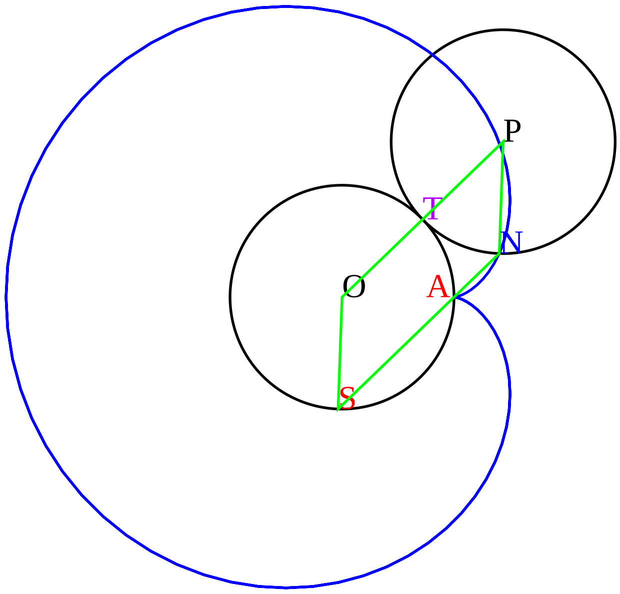
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



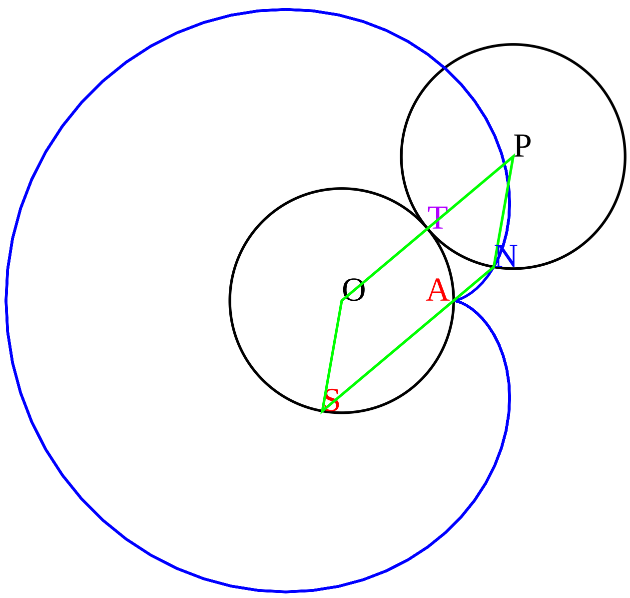
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



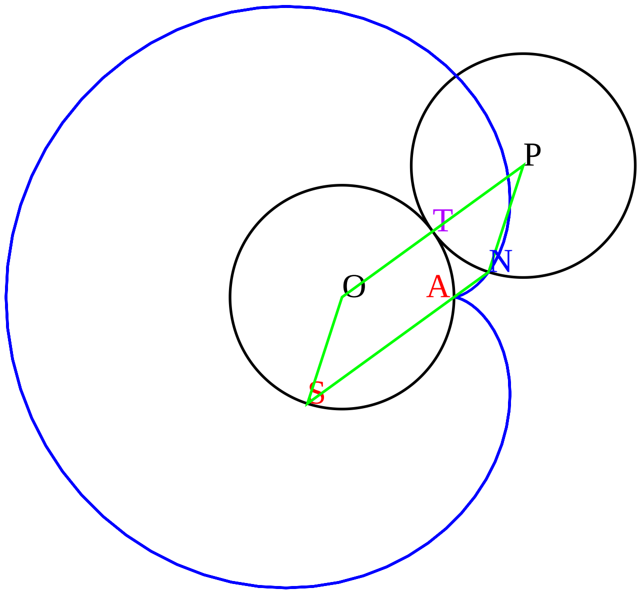
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



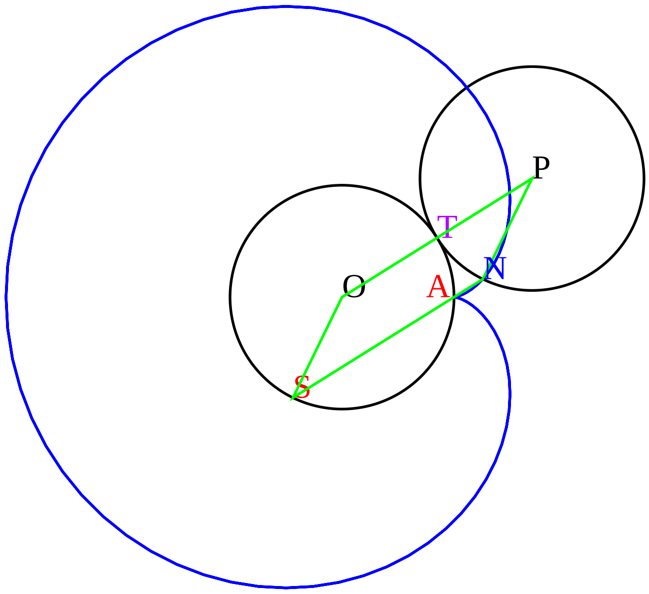
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



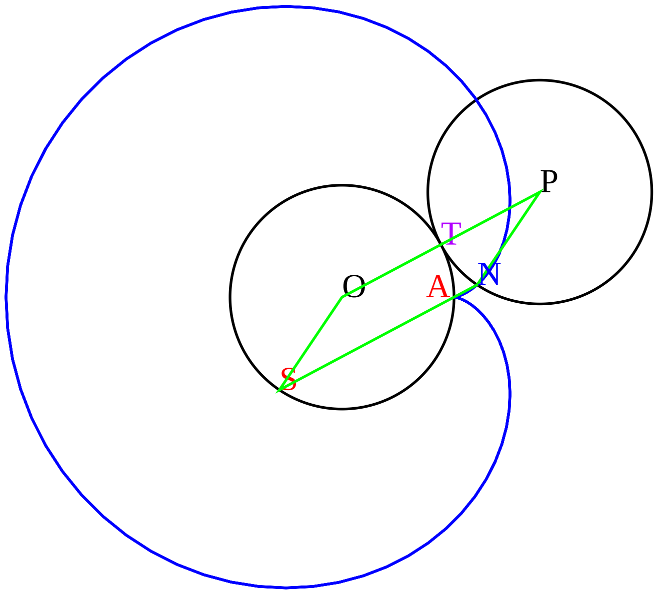
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



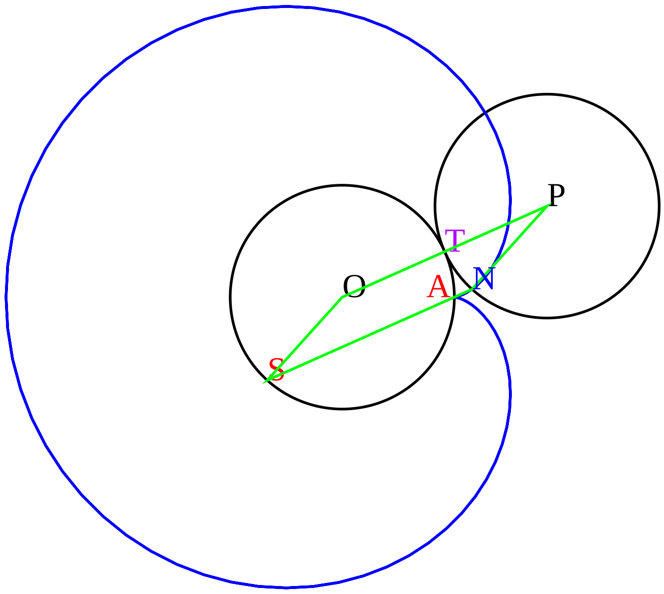
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



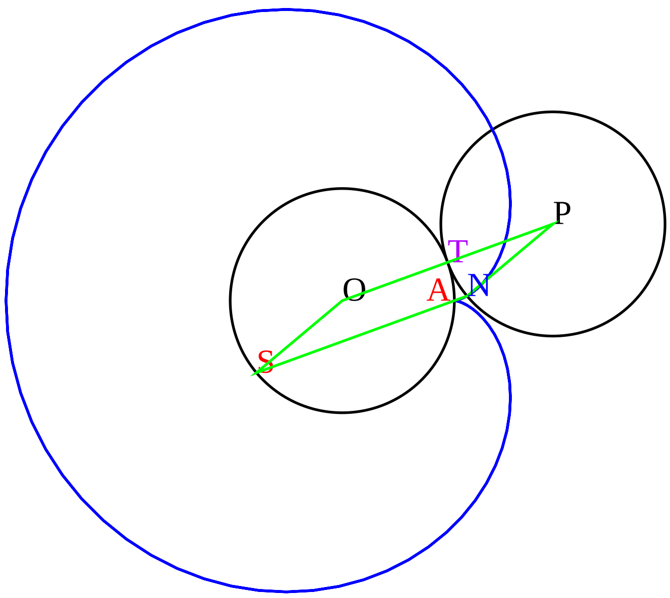
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



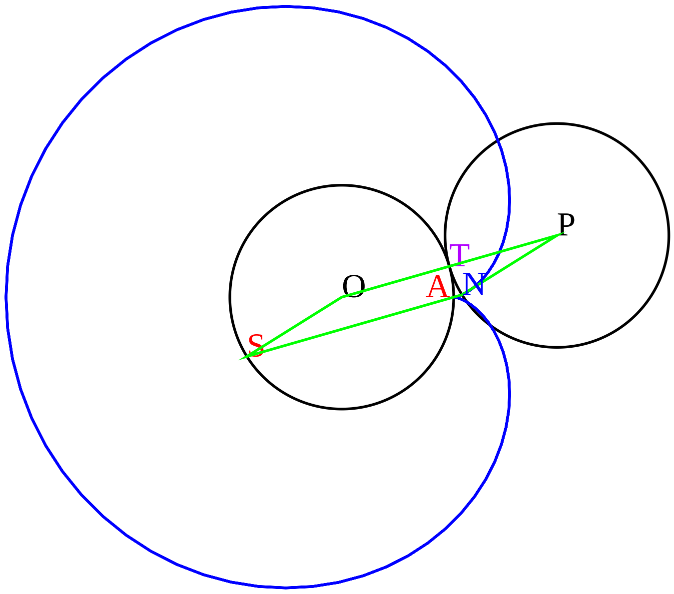
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



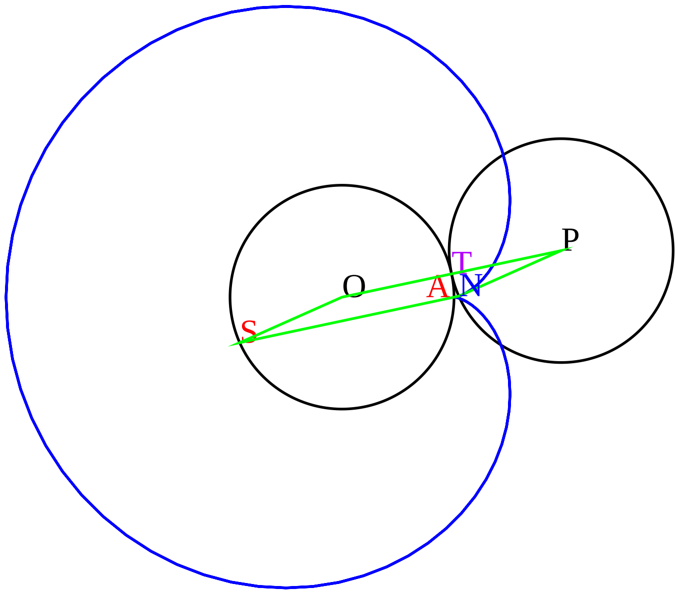
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



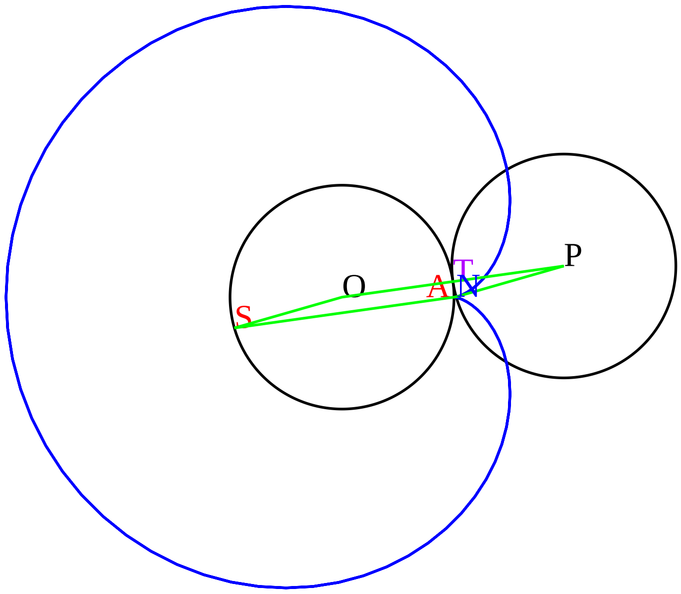
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



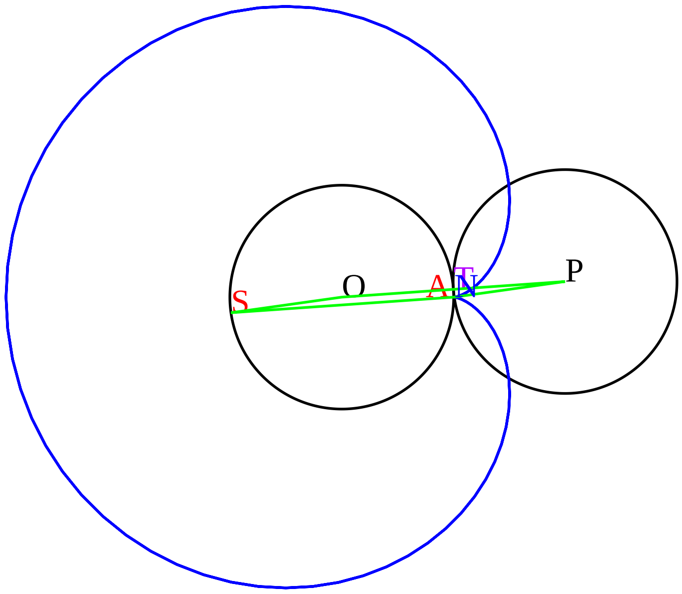
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



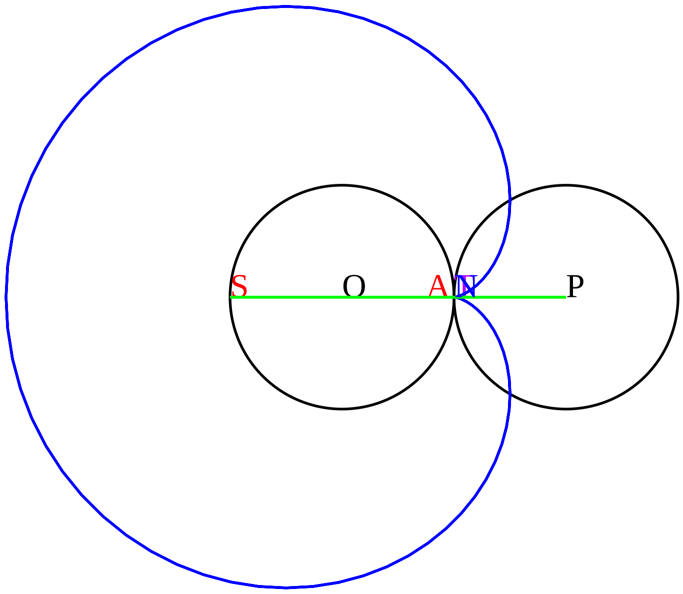
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



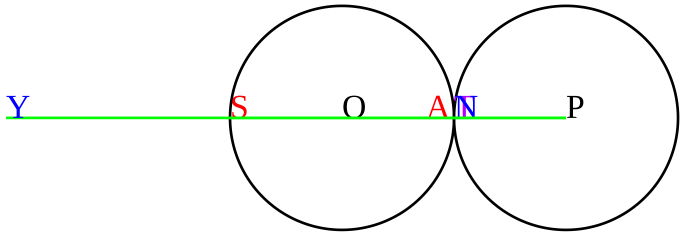
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



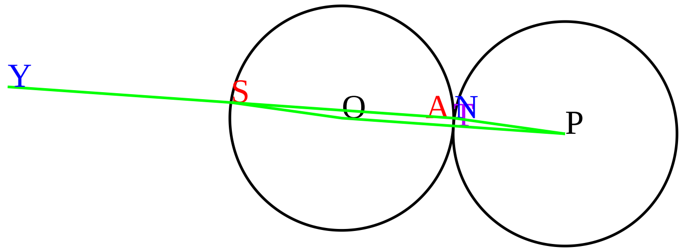
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



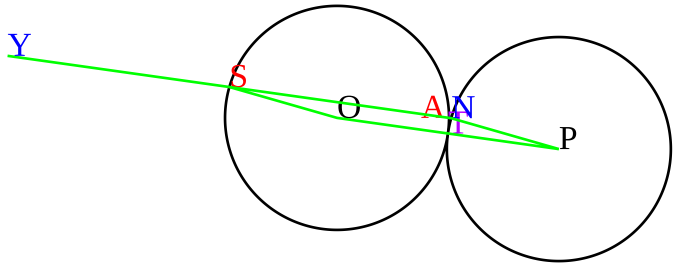
The motion of the point N is not uniform. It lingers A and accelerates as it moves away from A. The reason is that N participates in two separate motions. The moving circle rotates around its center P which show itself circles around O (center of the stationary circle.) While the point P moves through angle AOP = angle AOT, the point N moves through angle TPN. Since the circles move without slipping, then angle AOT = angle TPN. But P moves at the end of the radius OP which is twice as PN. Therefore, the angular velocity of N around P is twice that of P around O. If at all times OS is equal and parallel to PN, then S circles around O at the angular speed which is double that of P. Build a parallelogram OPNS with OP twice as long as OS, OS rotates twice as fast as OP. The fourth vertex N of the parallelogram will trace a cardioid.



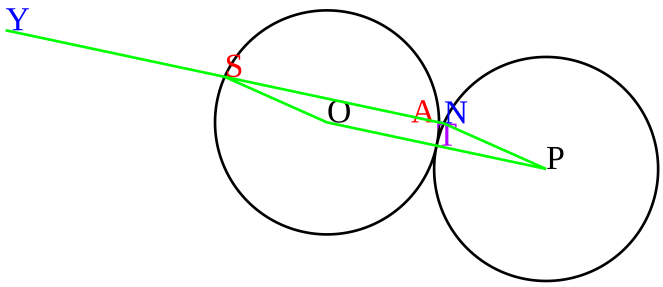
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



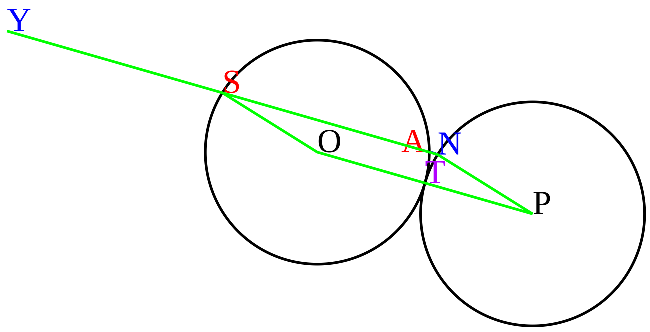
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



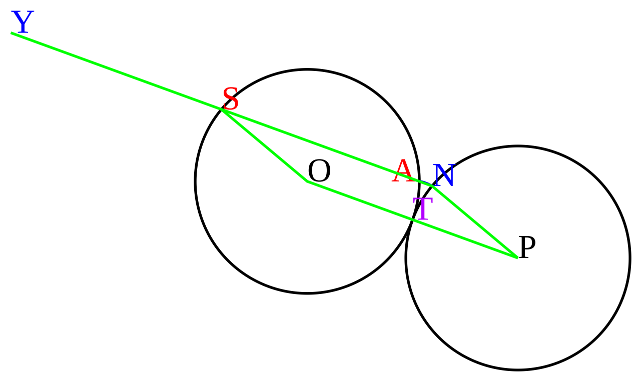
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



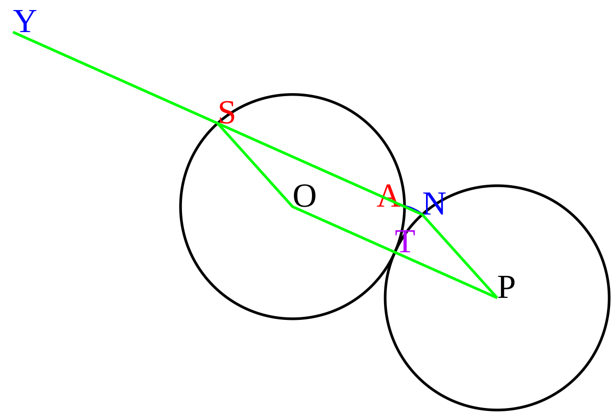
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



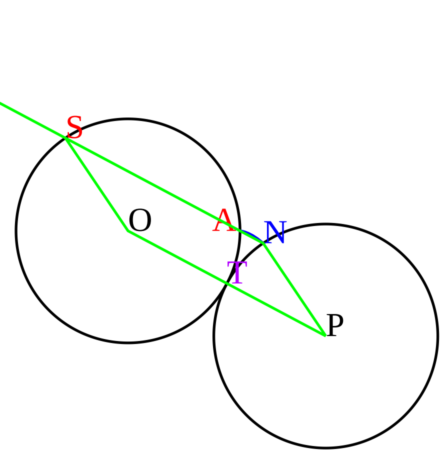
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



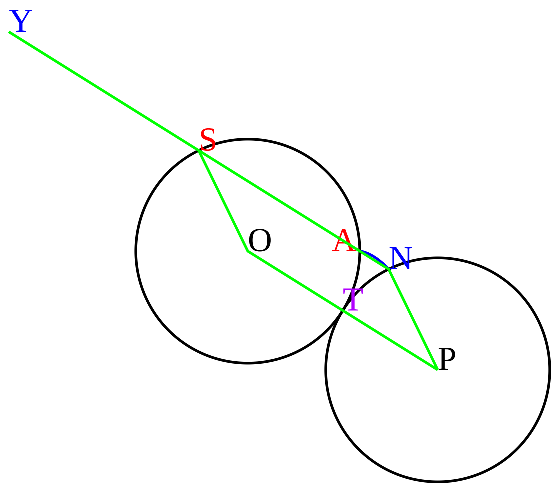
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



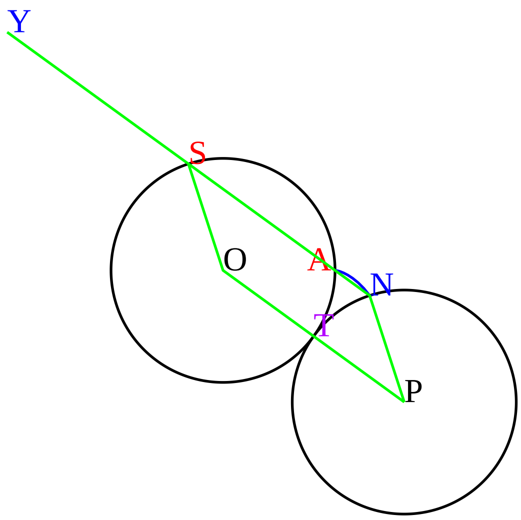
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



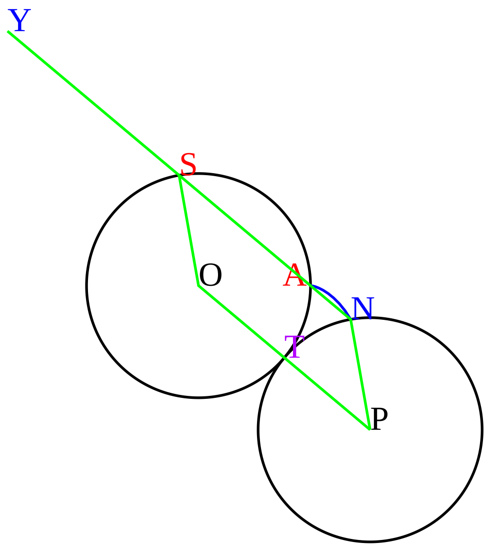
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



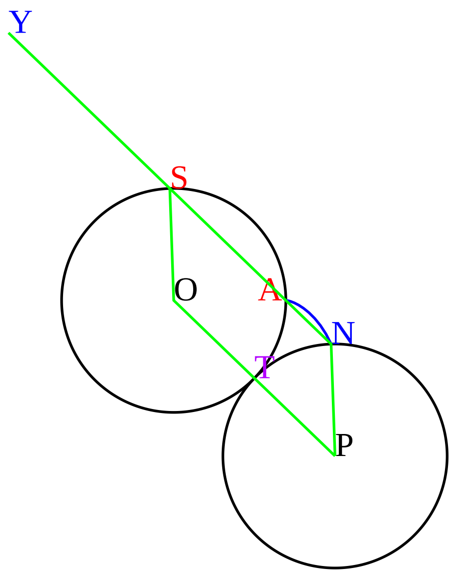
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



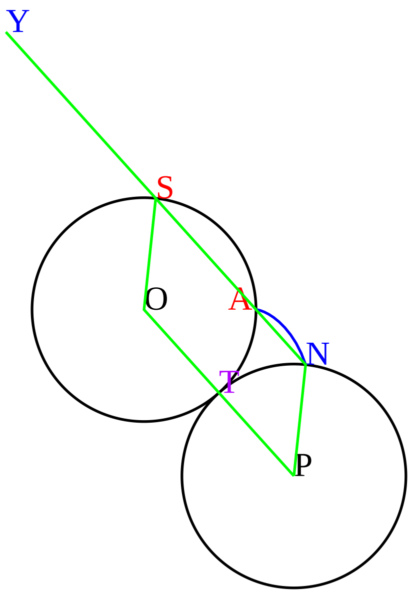
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



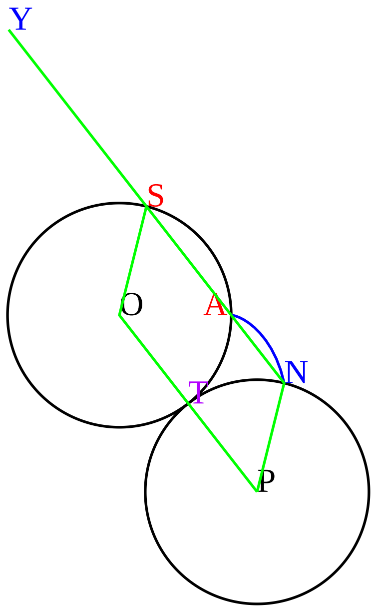
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



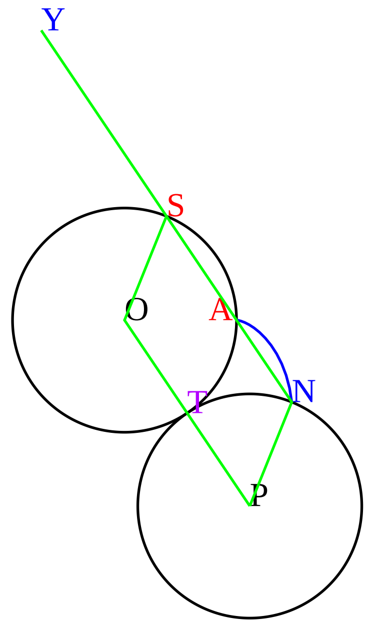
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



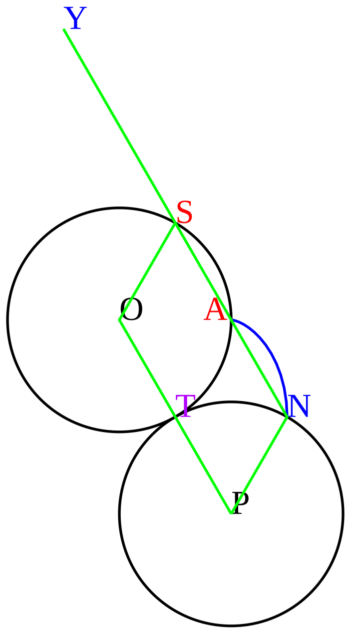
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



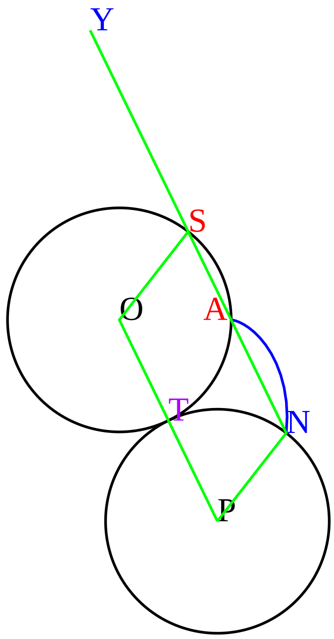
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



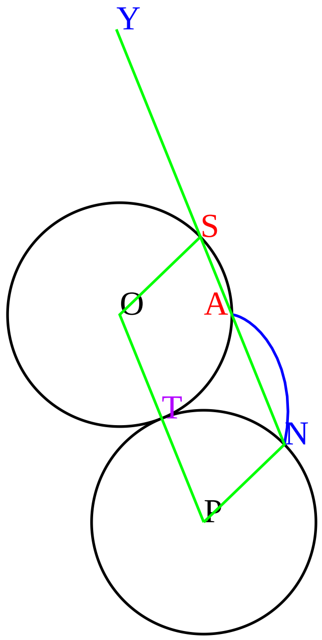
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



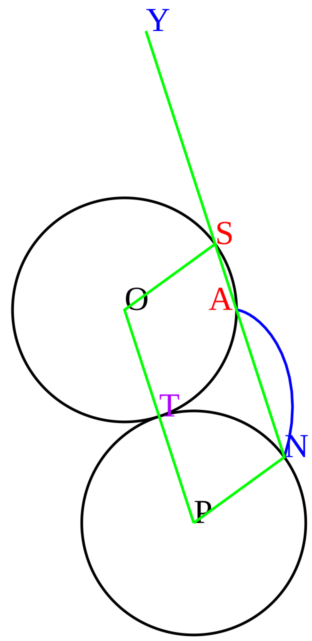
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



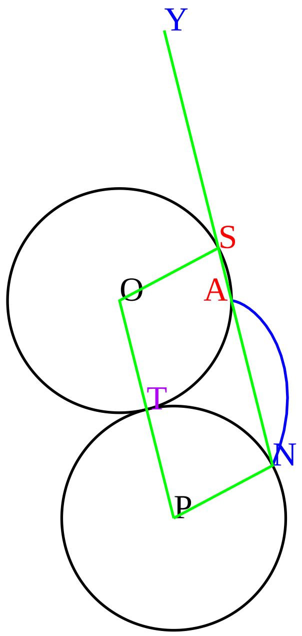
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



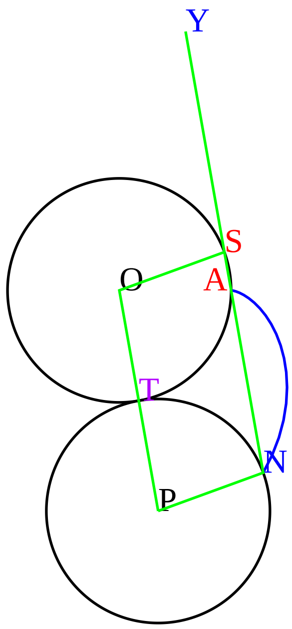
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



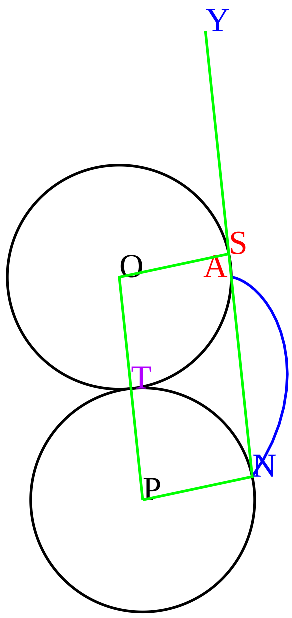
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



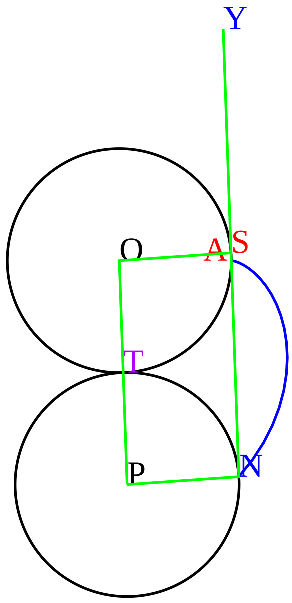
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



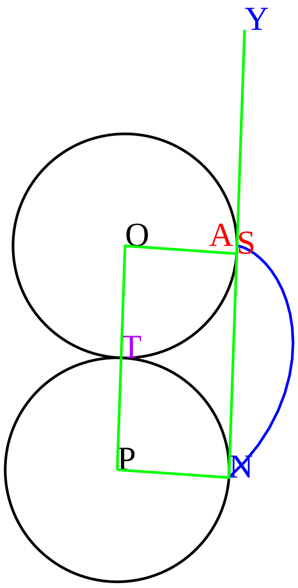
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



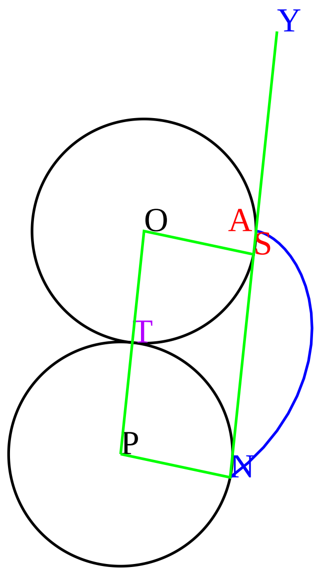
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



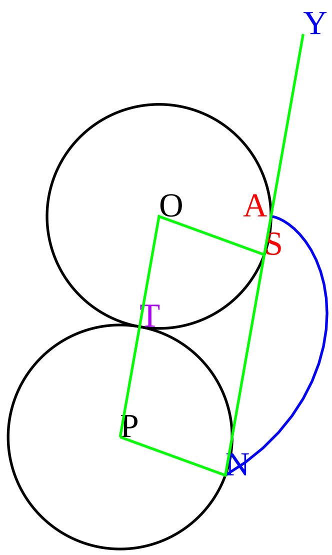
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



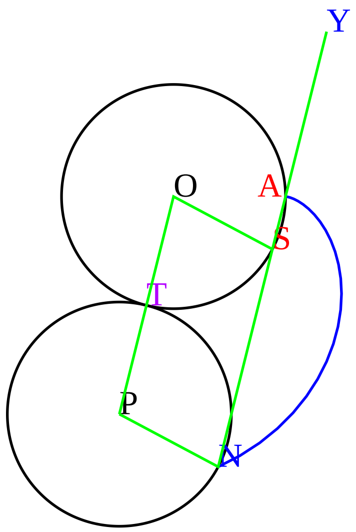
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



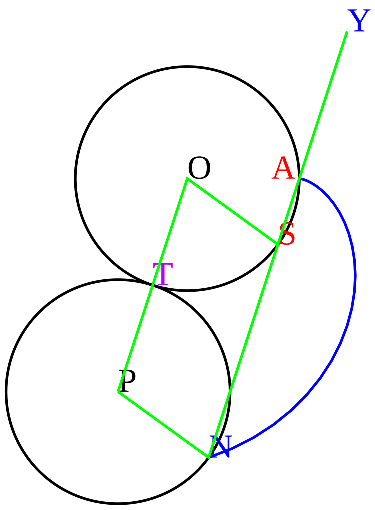
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



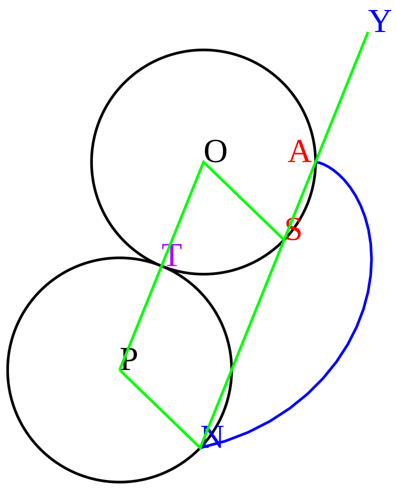
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



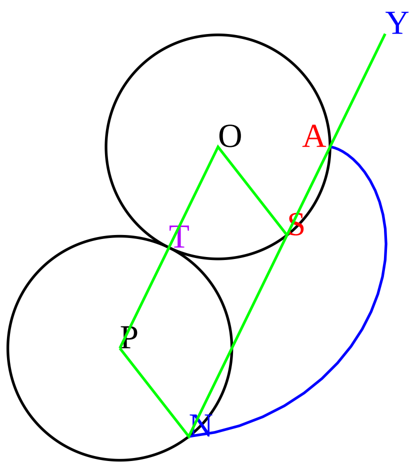
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



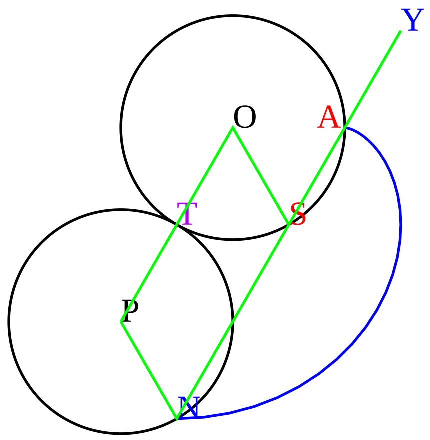
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



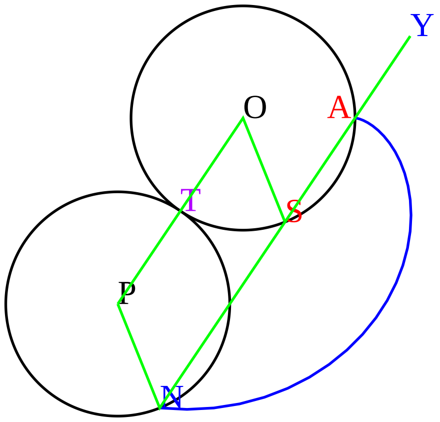
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



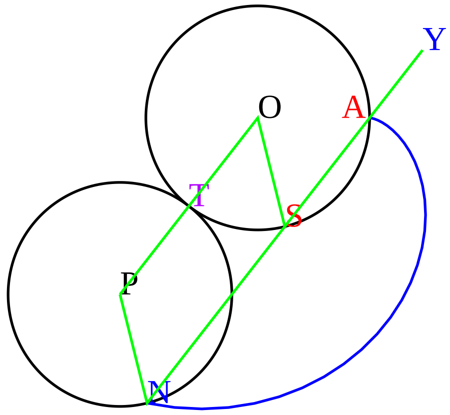
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



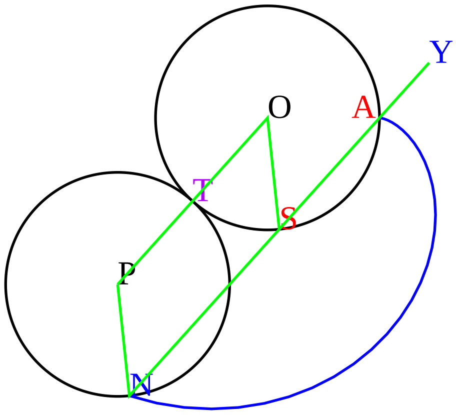
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



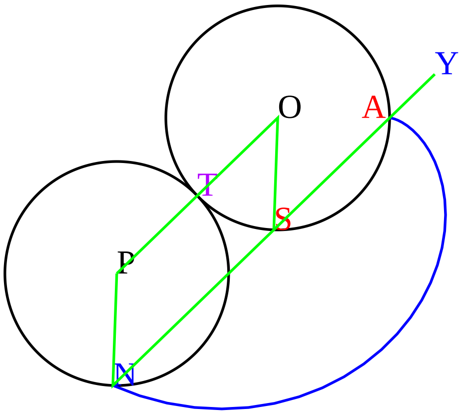
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



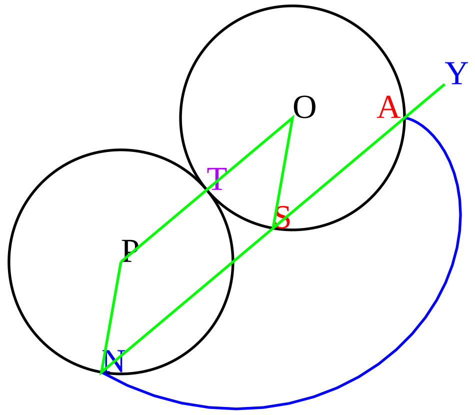
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



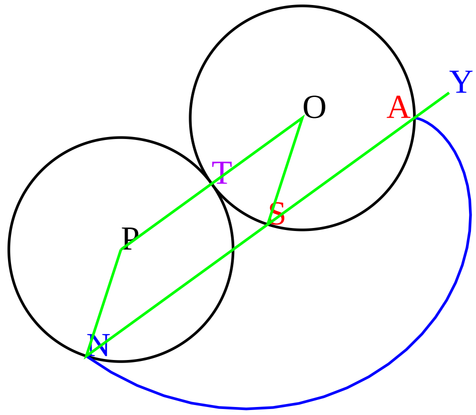
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



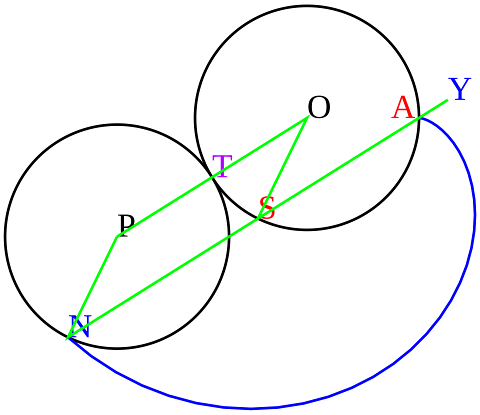
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



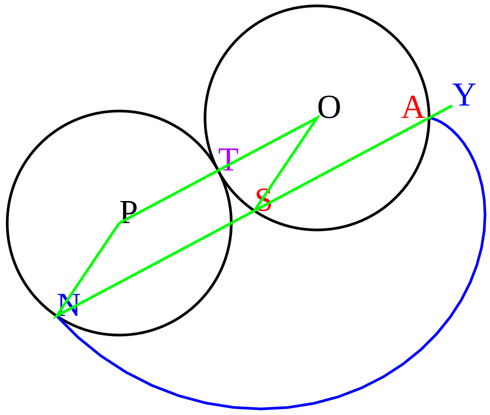
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



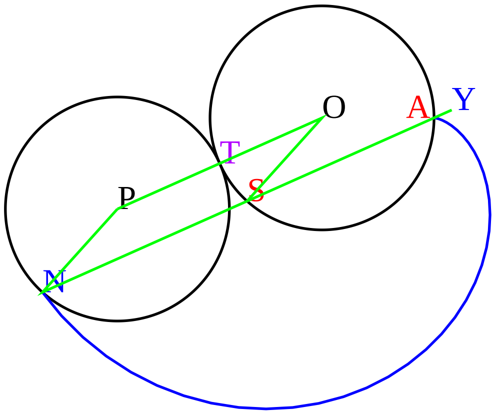
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



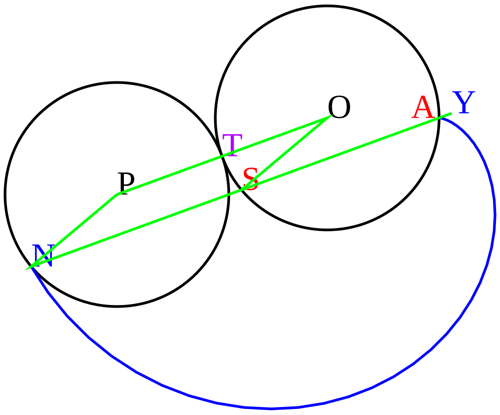
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



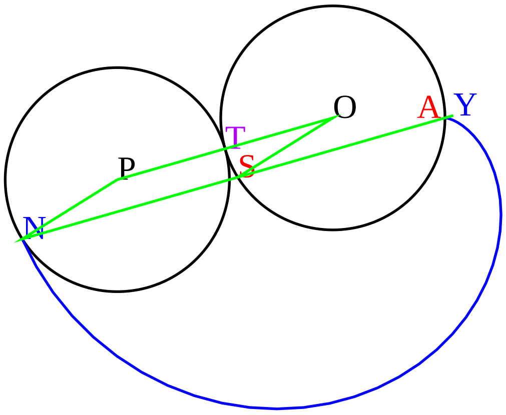
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



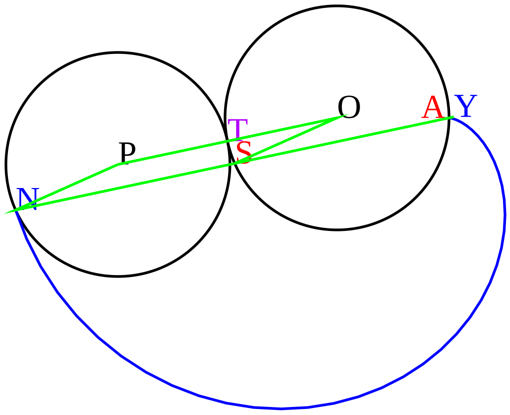
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



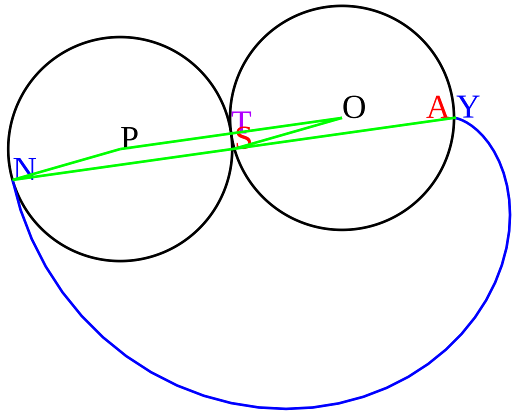
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



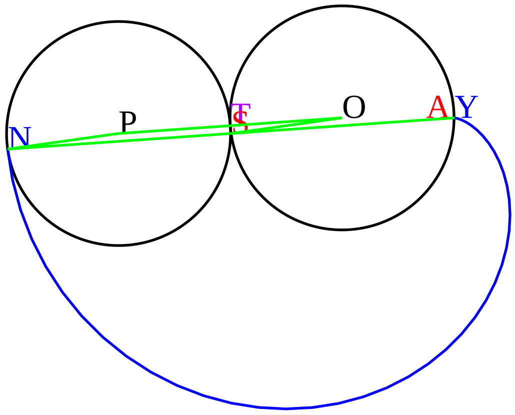
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



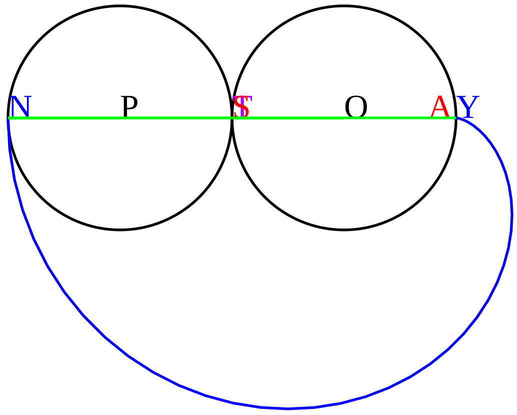
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



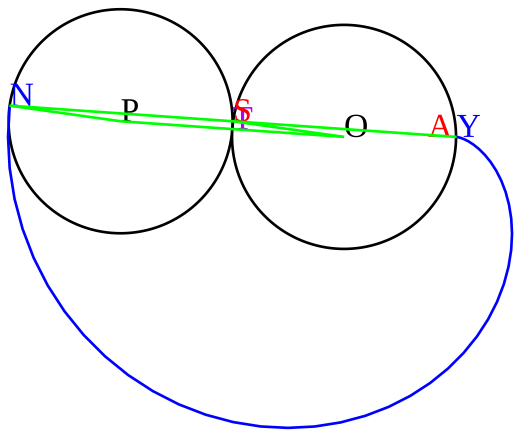
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



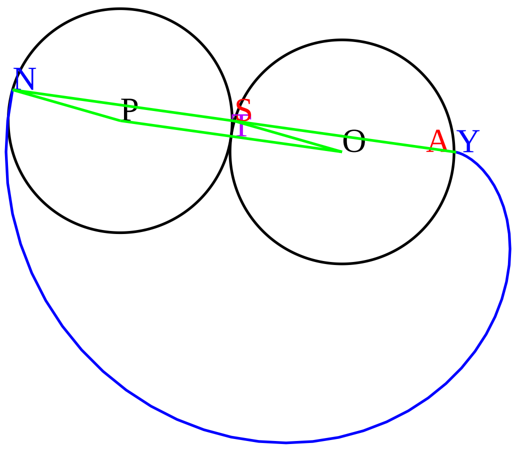
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



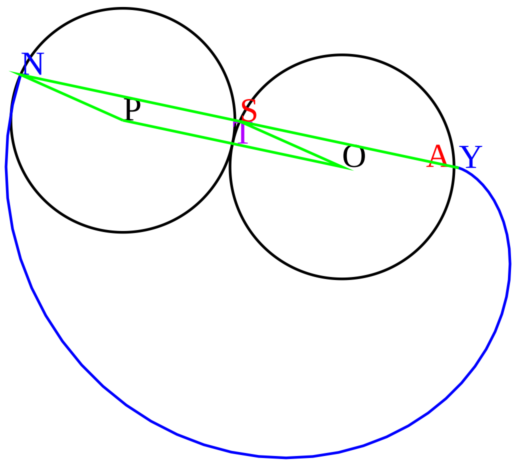
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



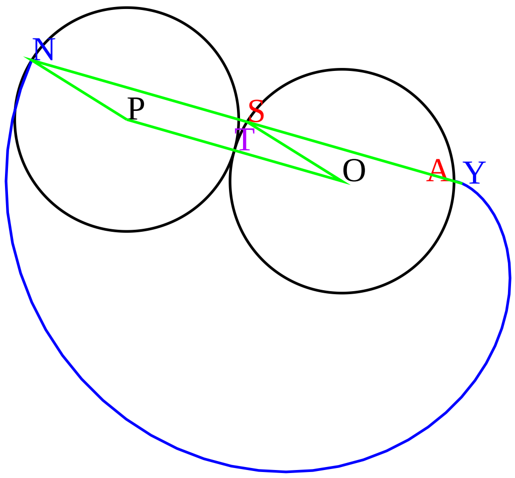
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



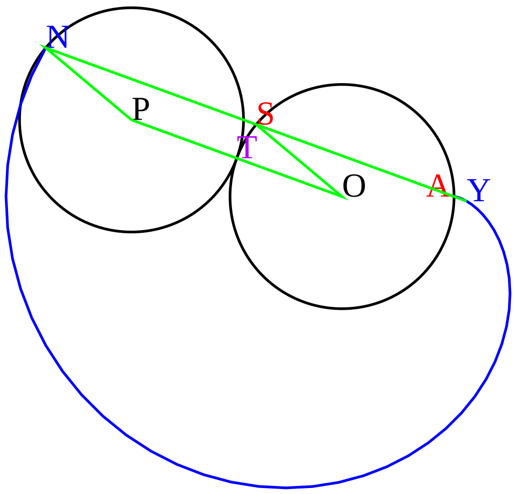
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



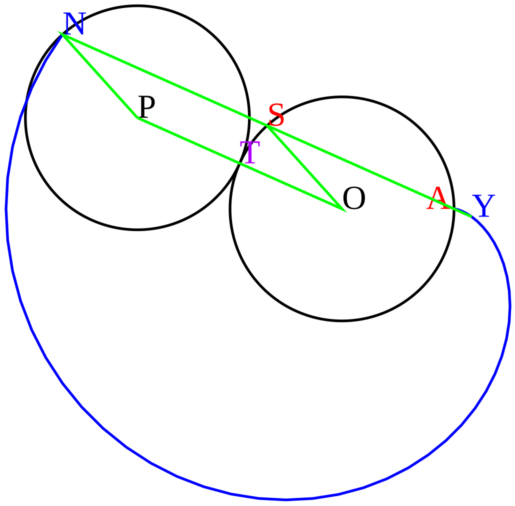
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



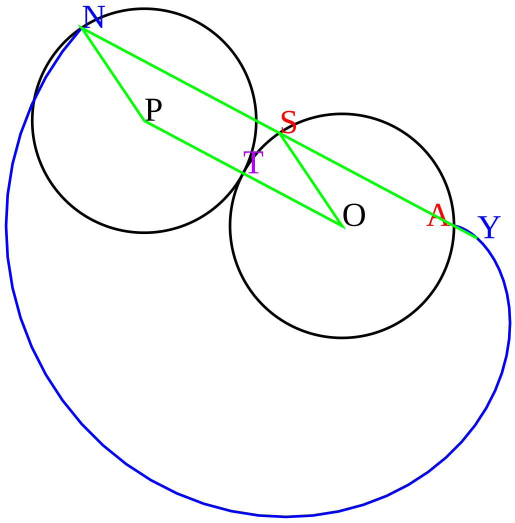
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



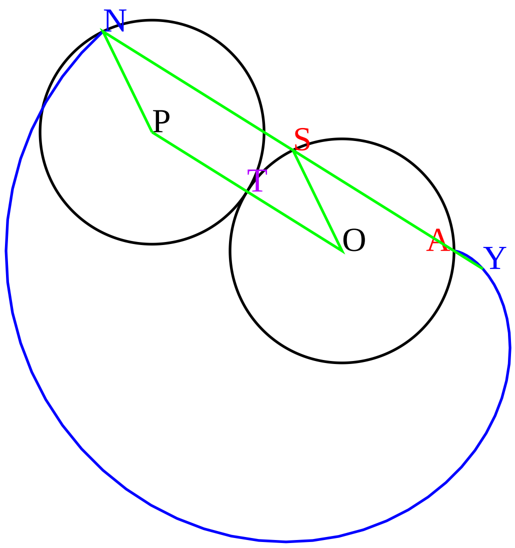
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



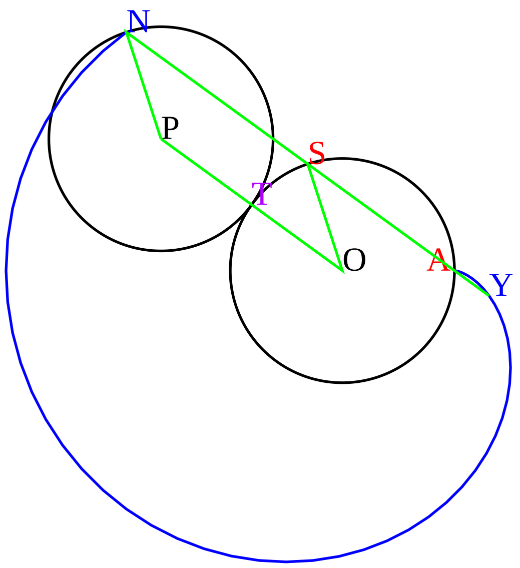
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



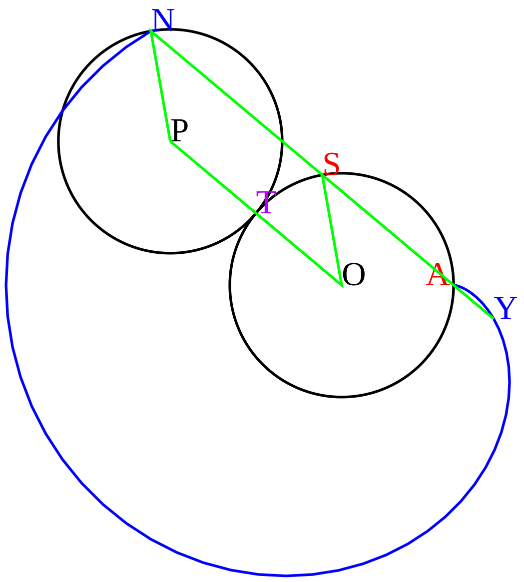
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



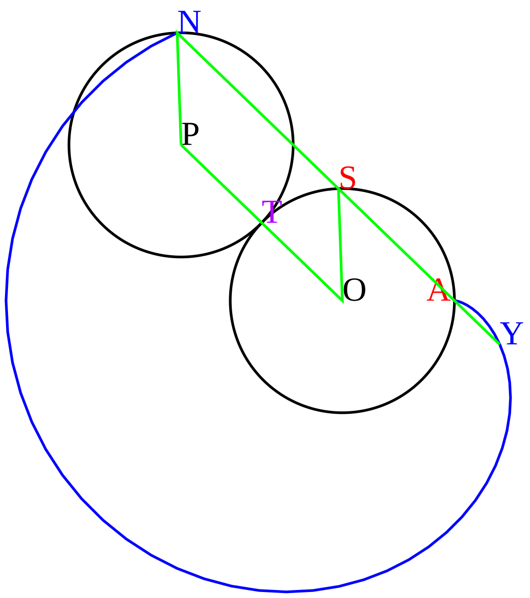
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



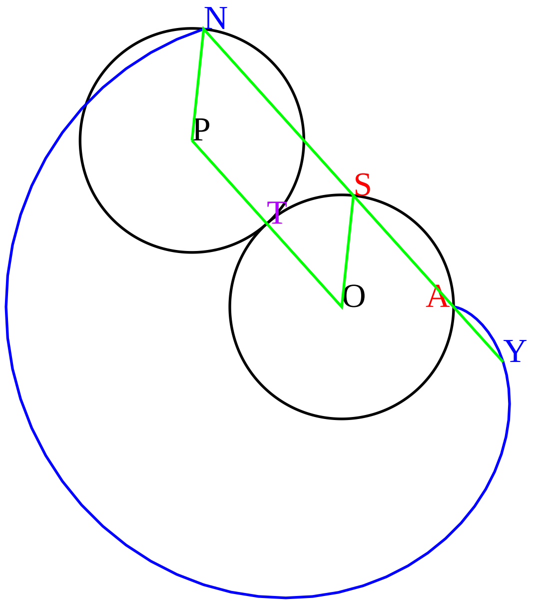
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



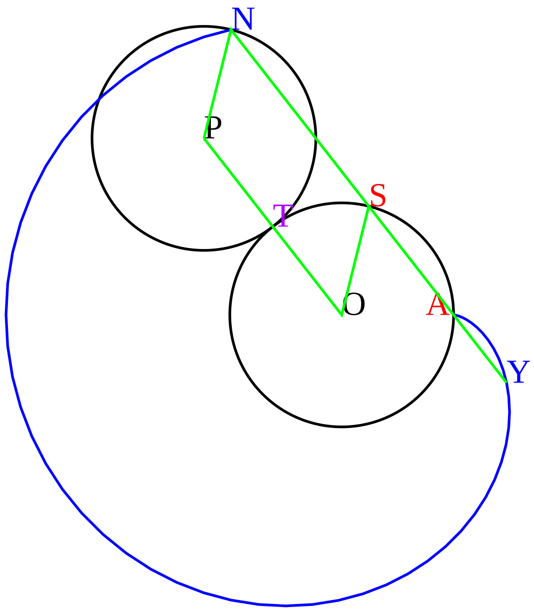
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



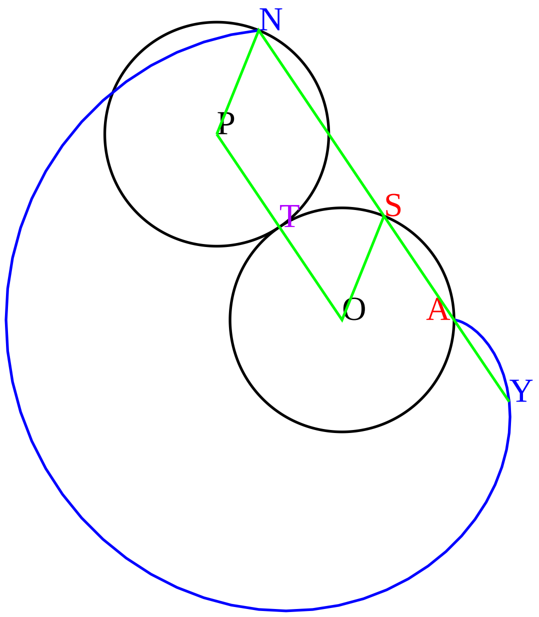
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



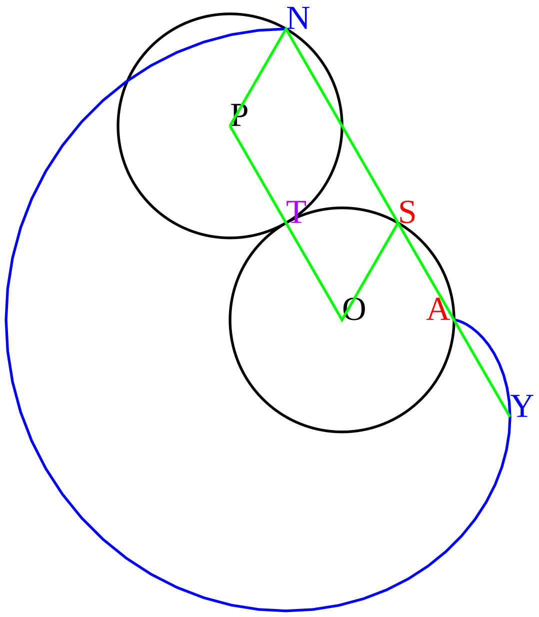
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



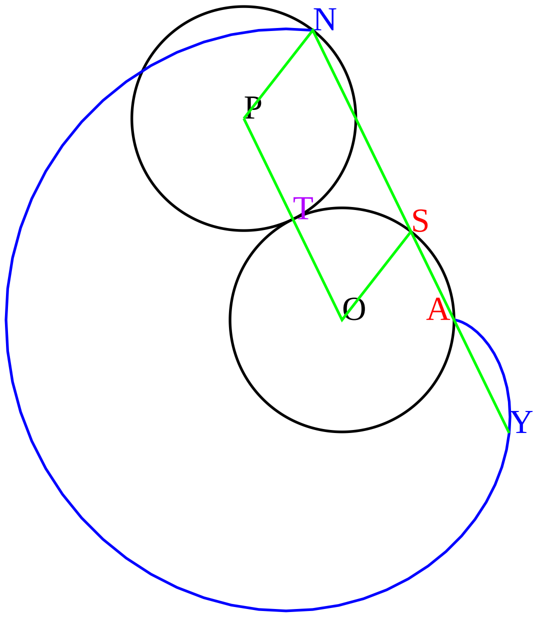
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



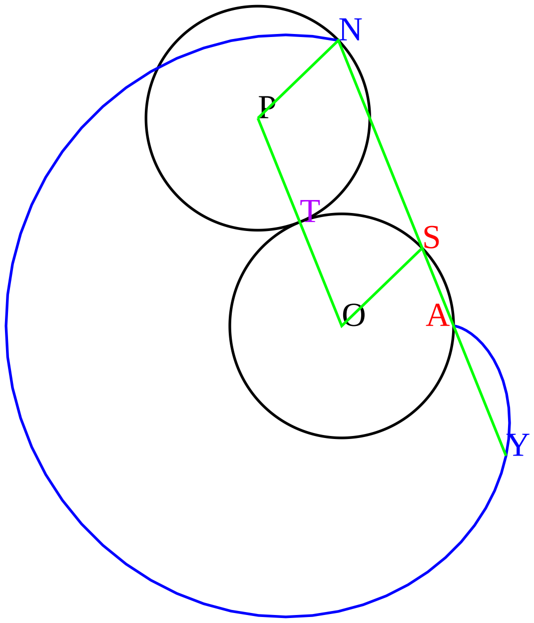
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



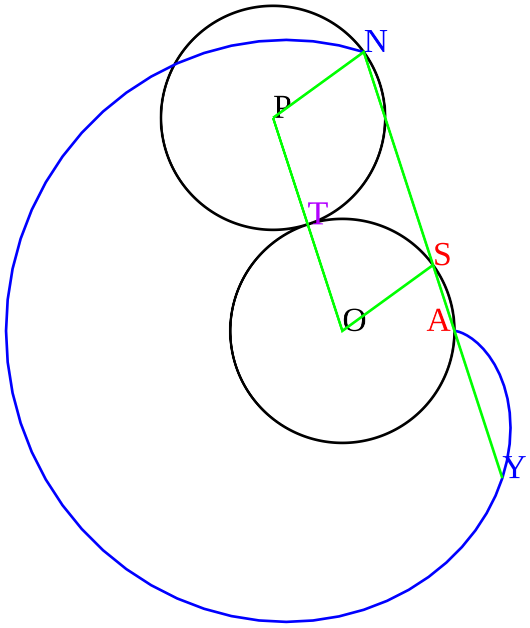
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



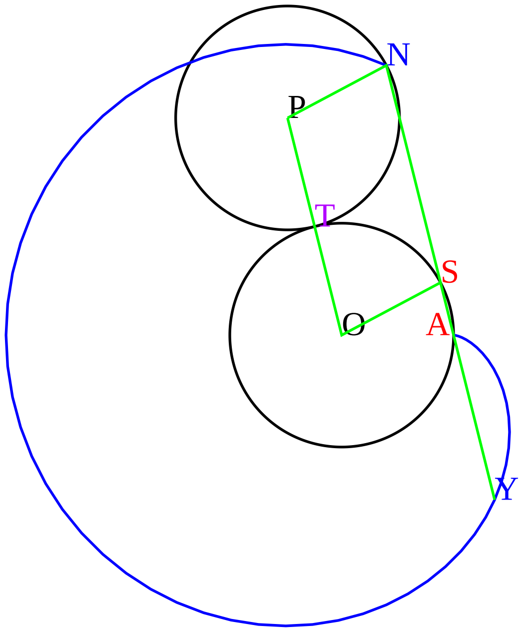
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



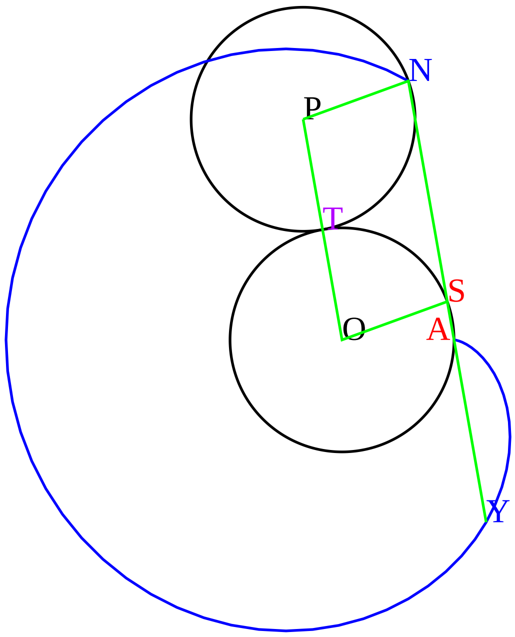
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



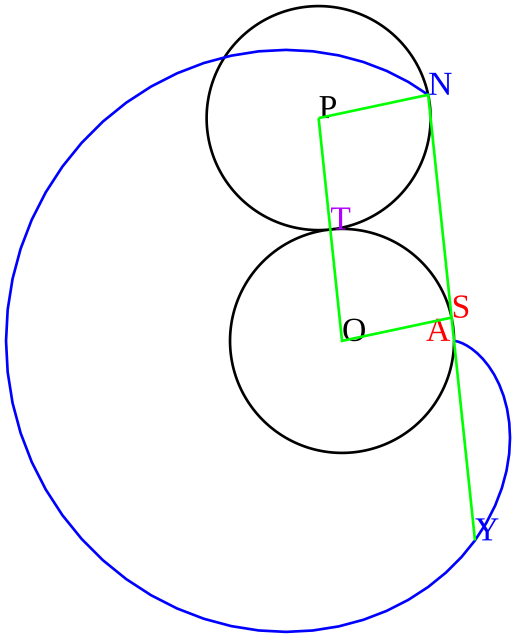
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



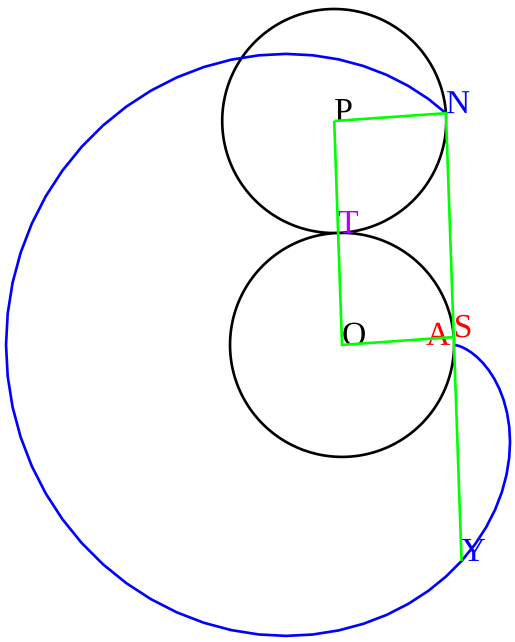
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



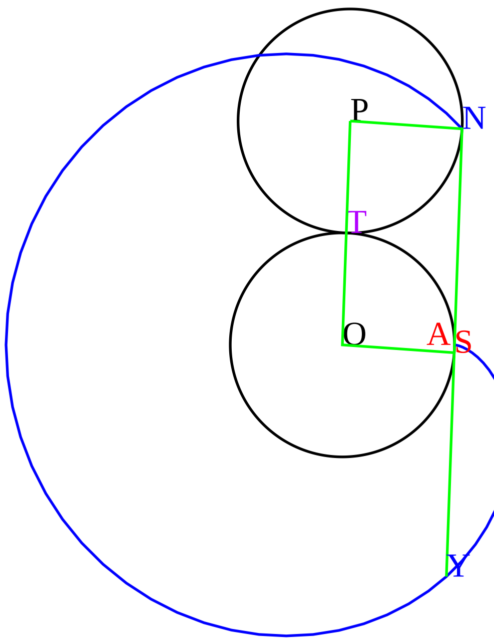
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



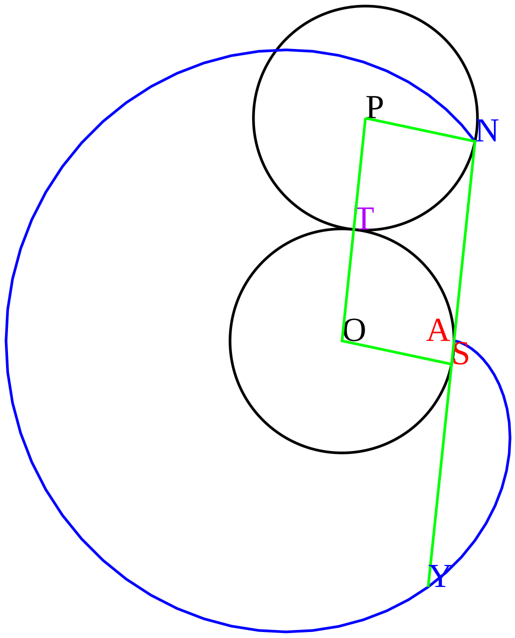
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



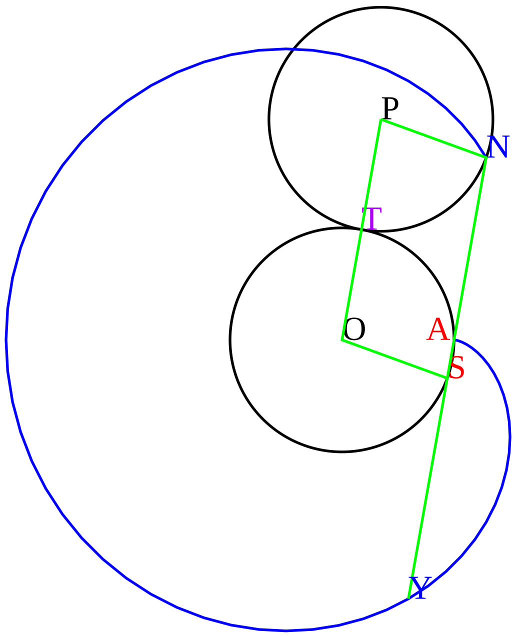
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



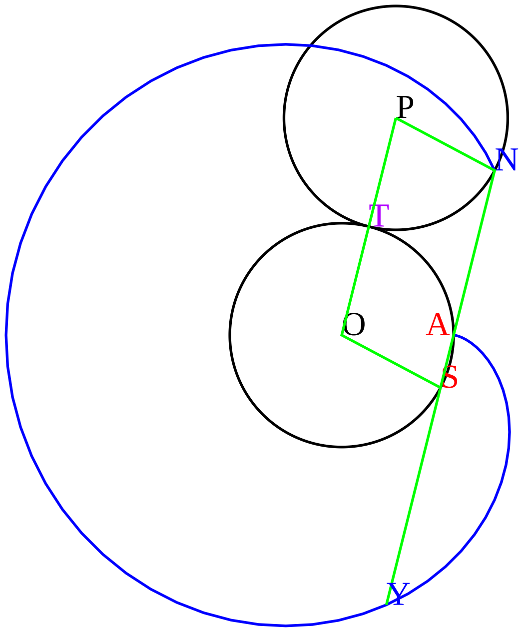
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



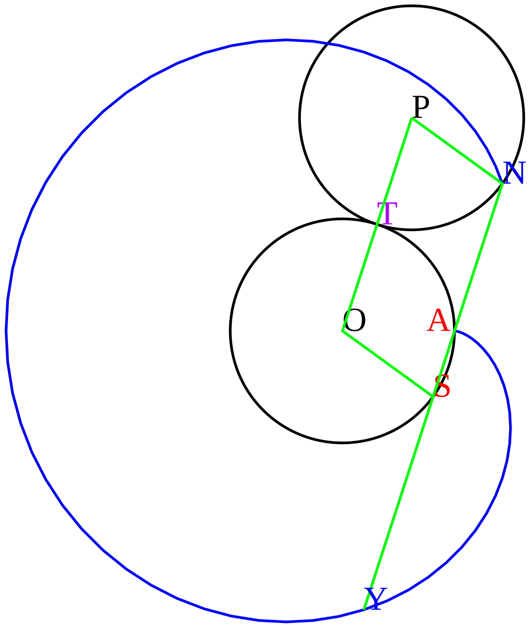
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



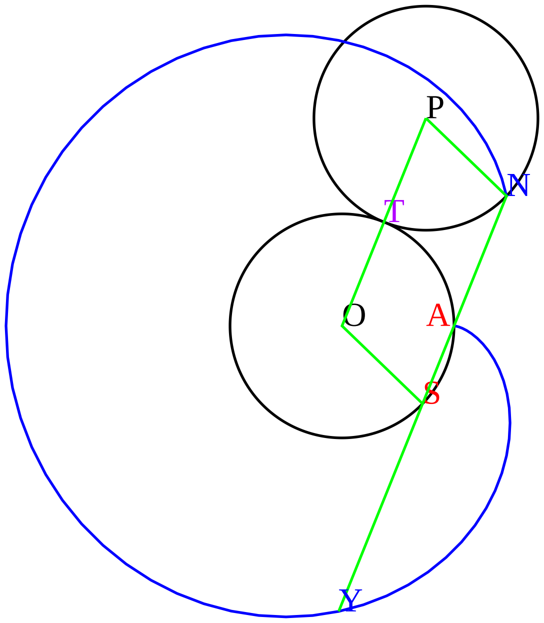
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



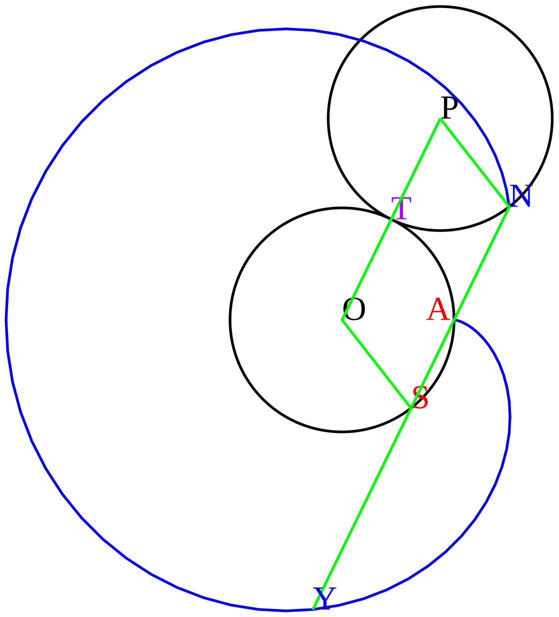
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



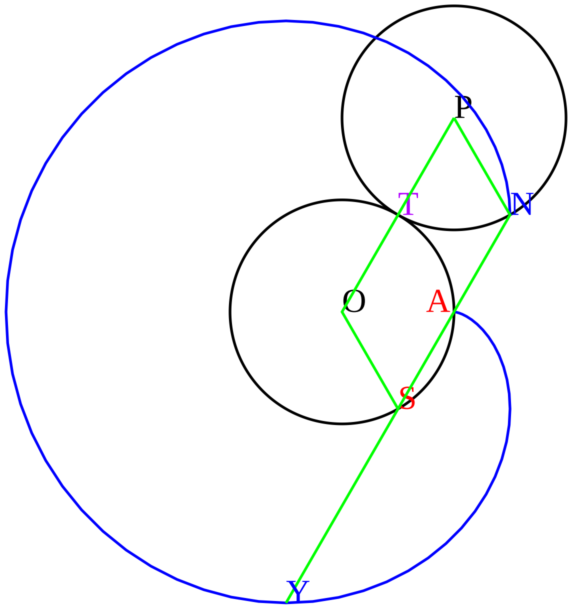
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



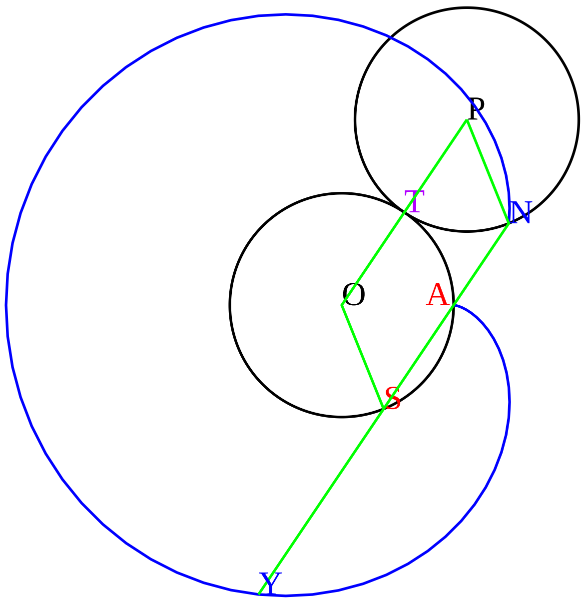
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



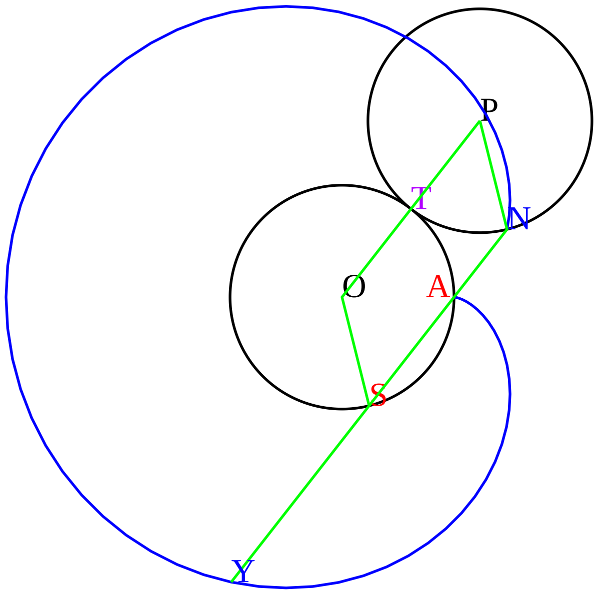
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



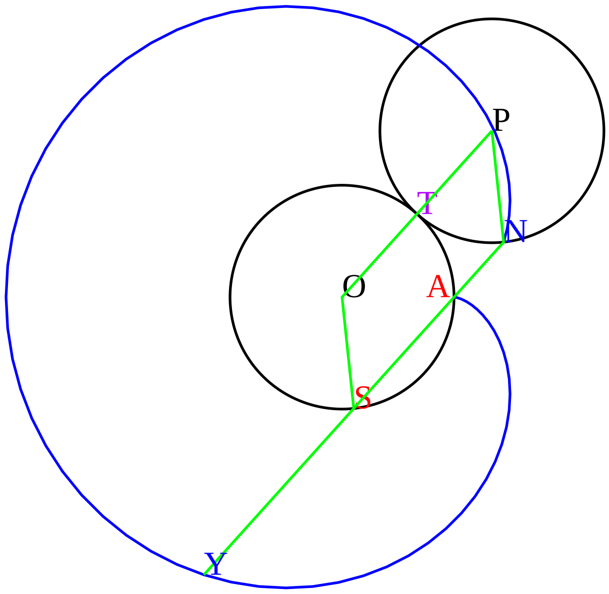
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



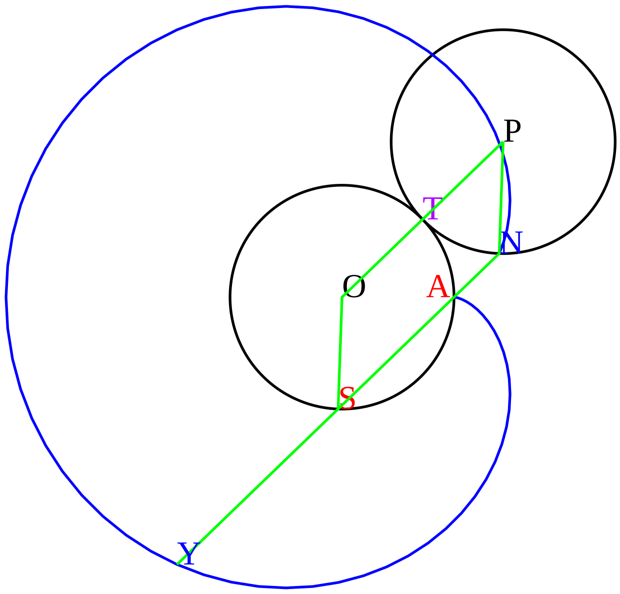
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



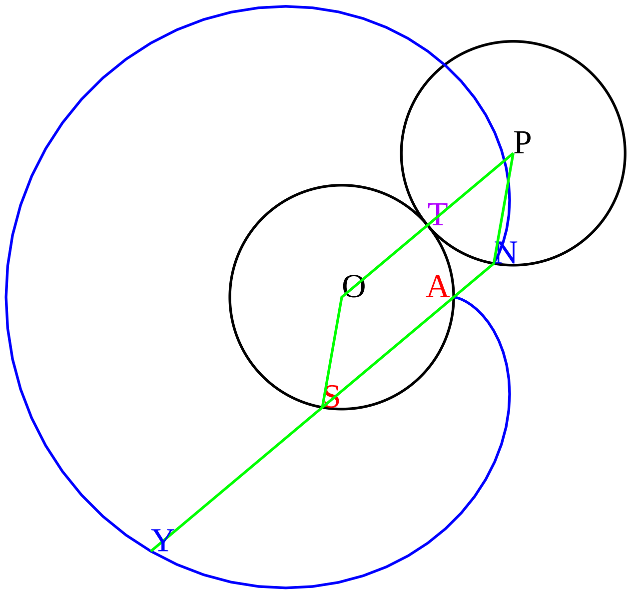
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



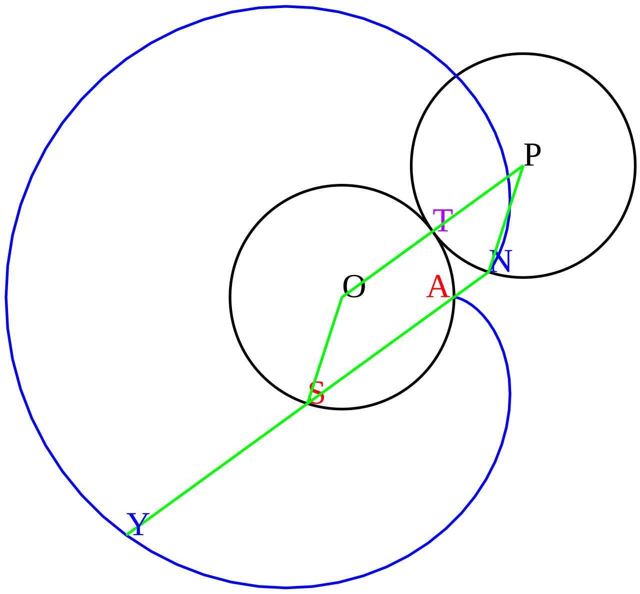
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



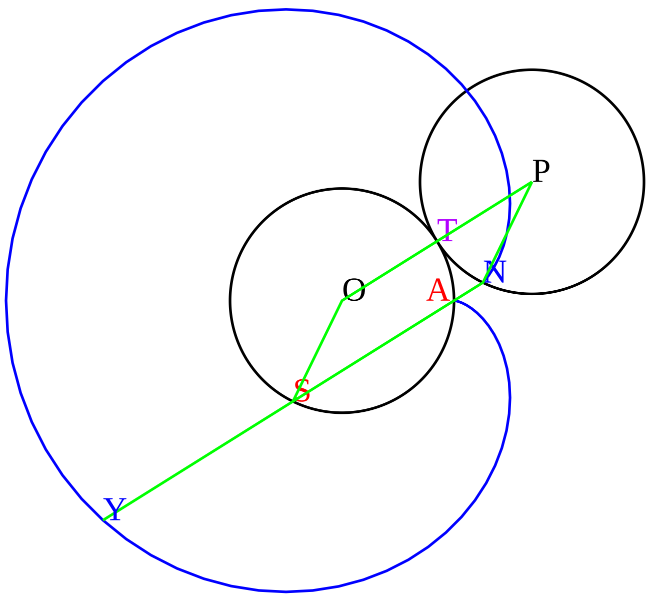
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



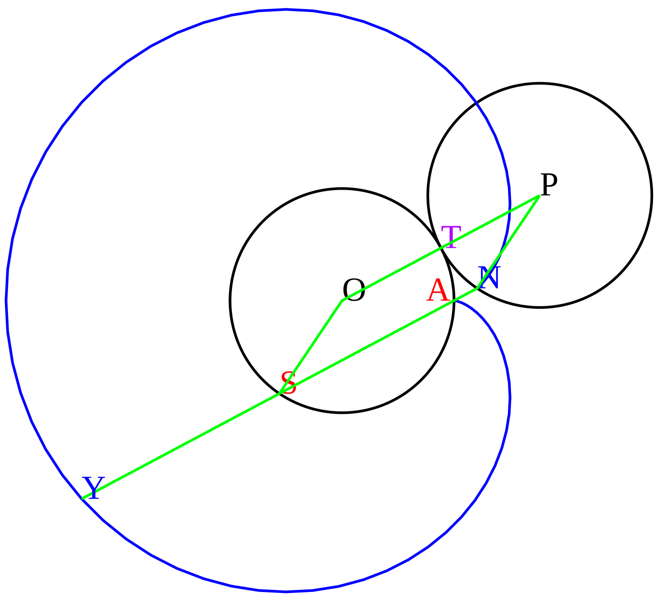
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



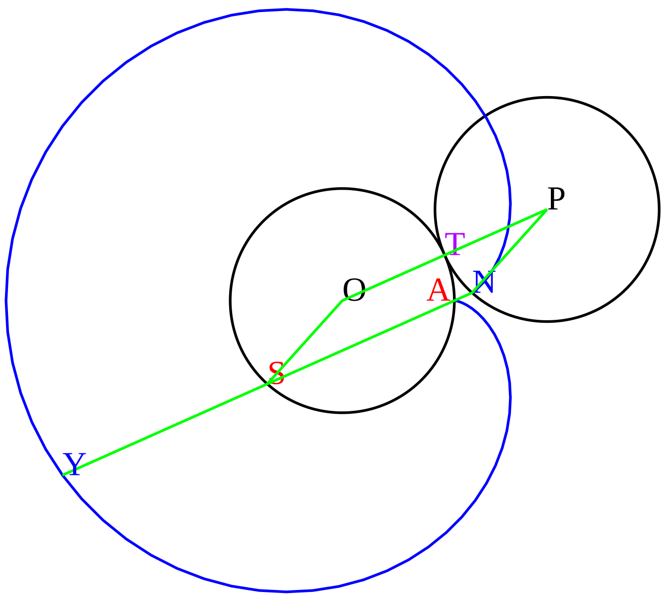
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



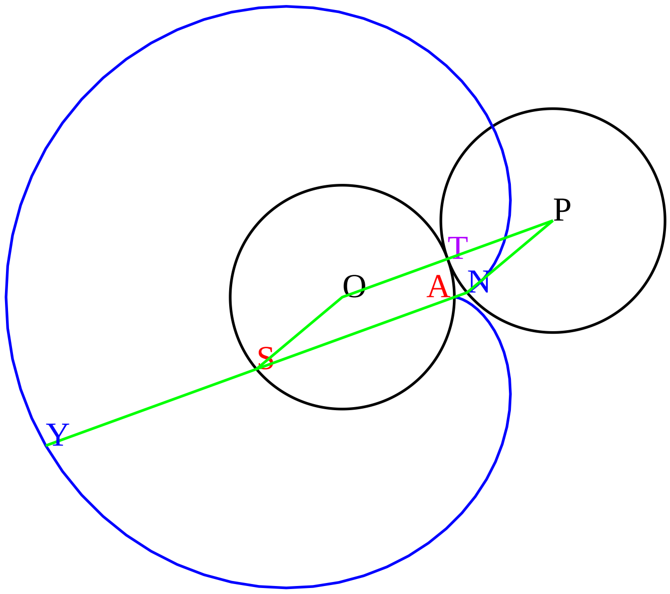
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



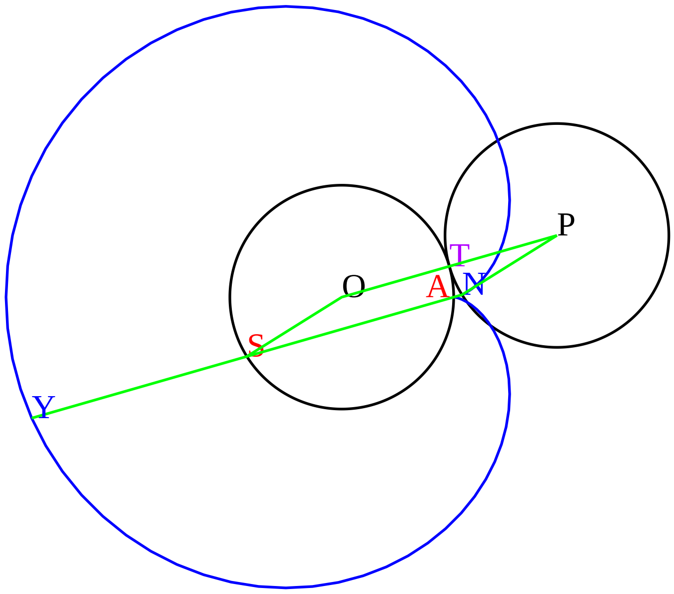
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



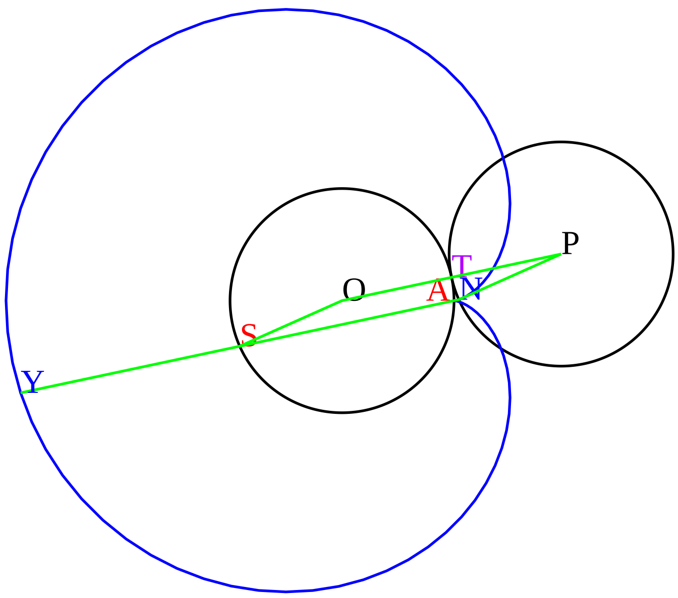
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



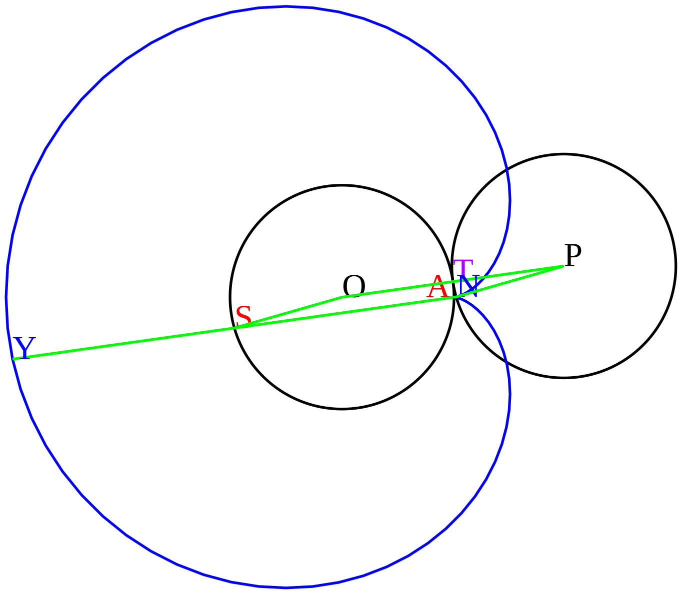
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



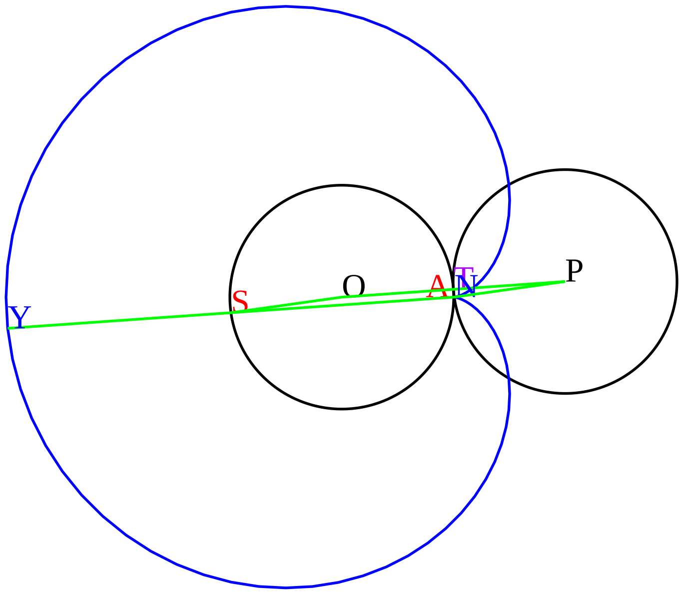
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



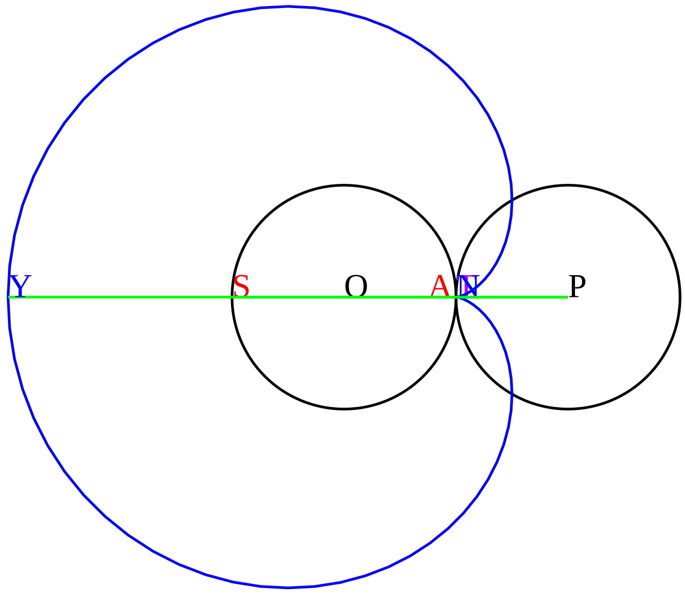
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



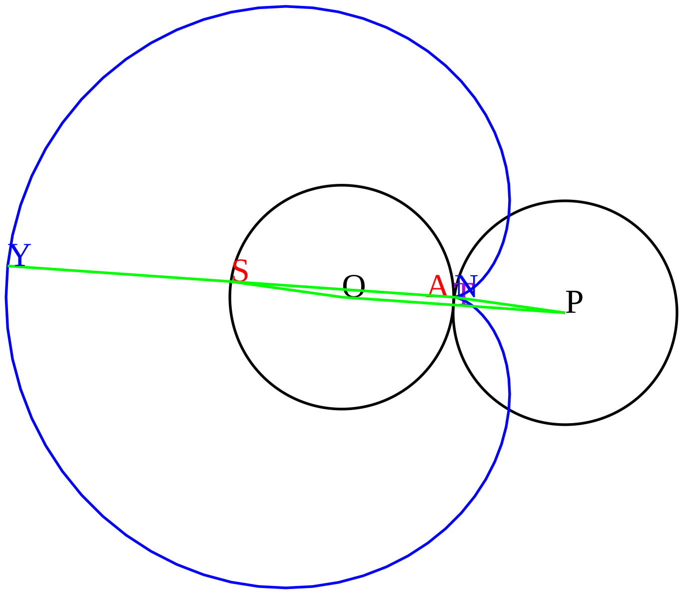
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



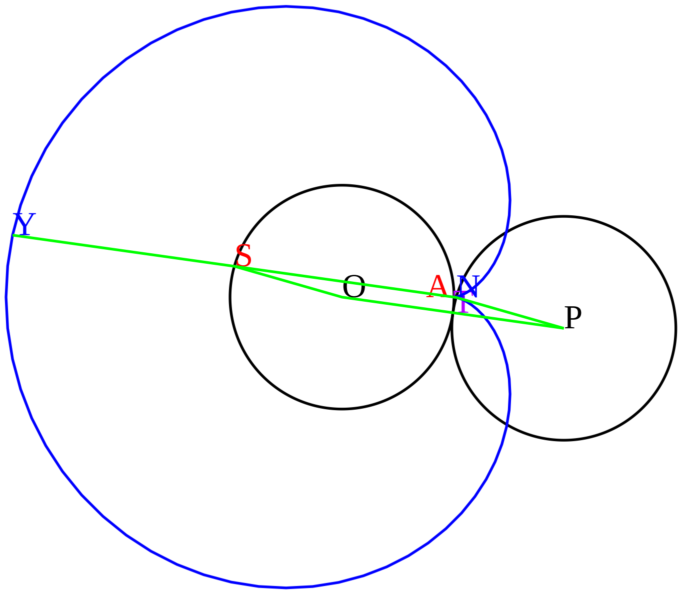
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



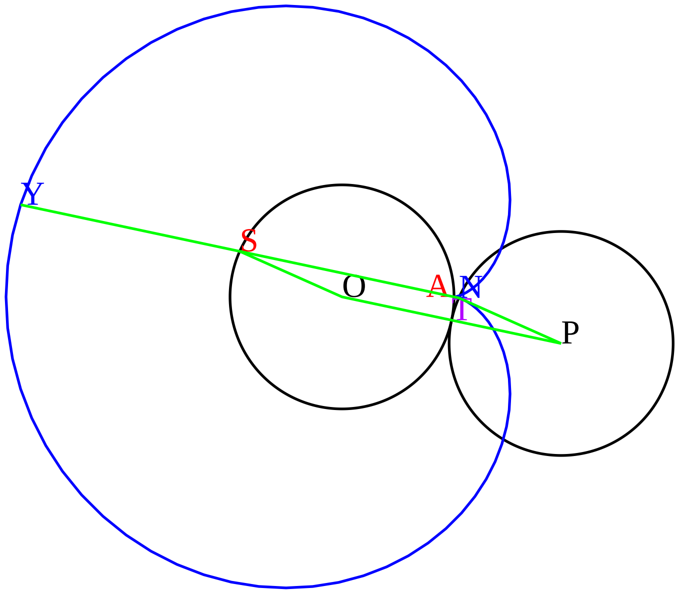
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



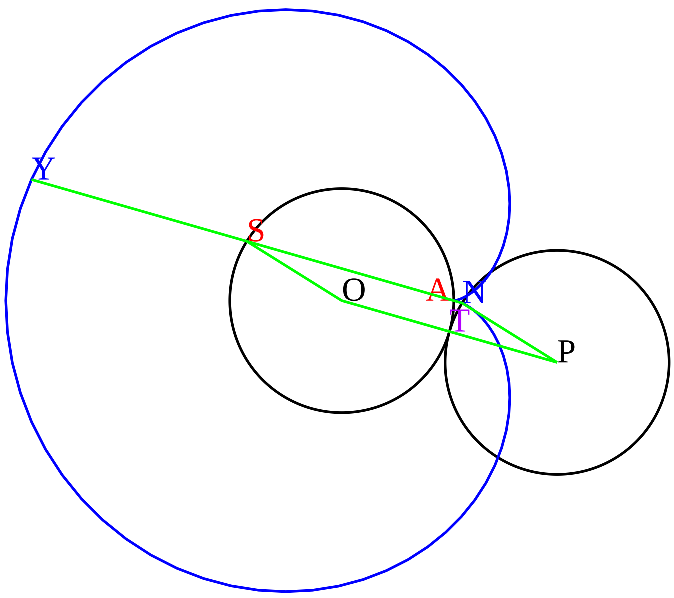
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



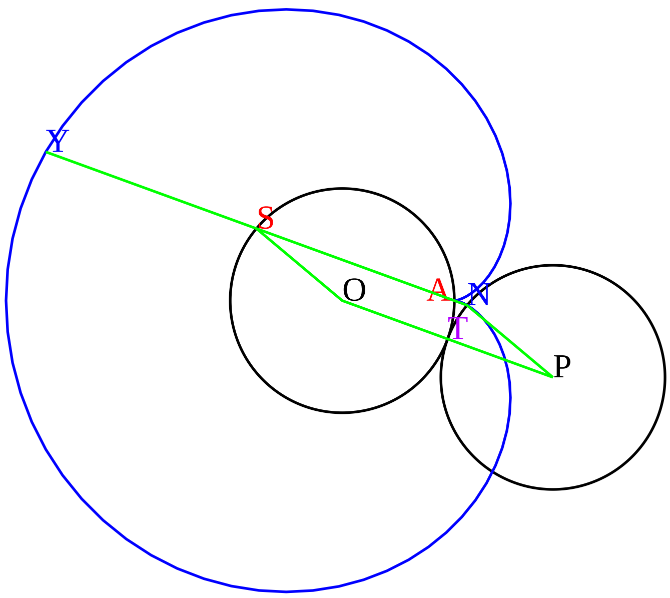
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



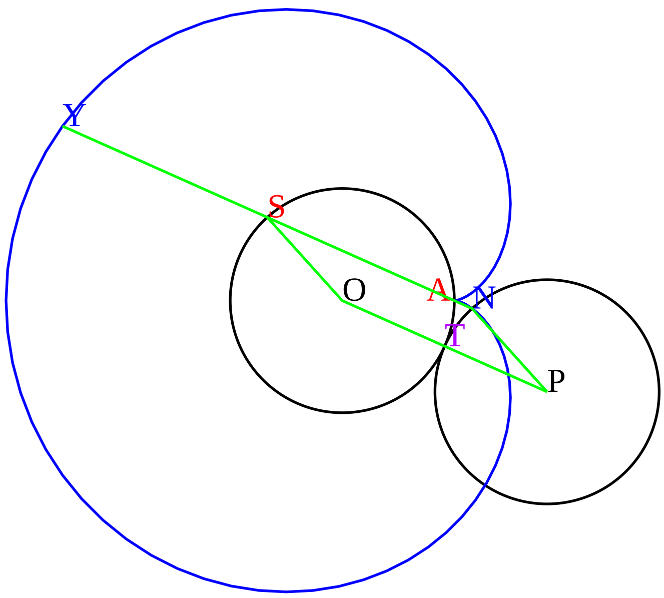
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



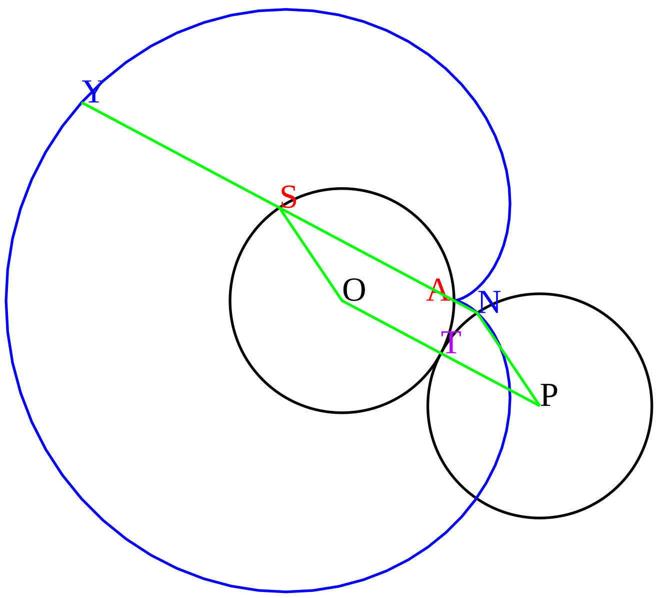
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



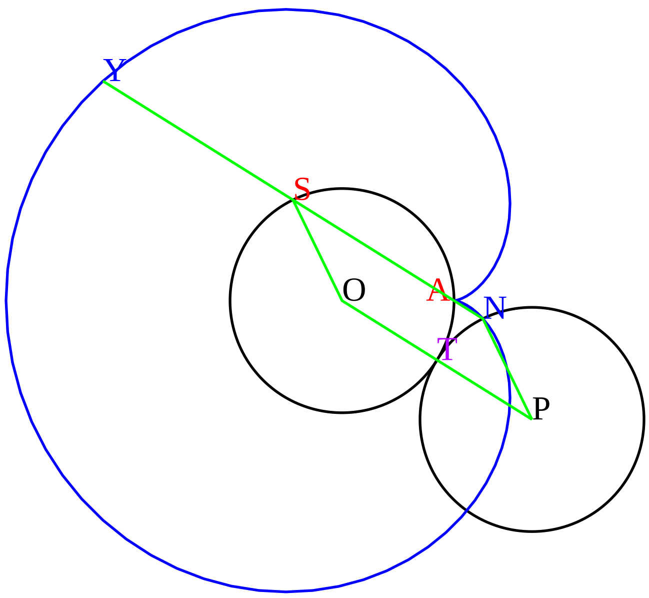
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



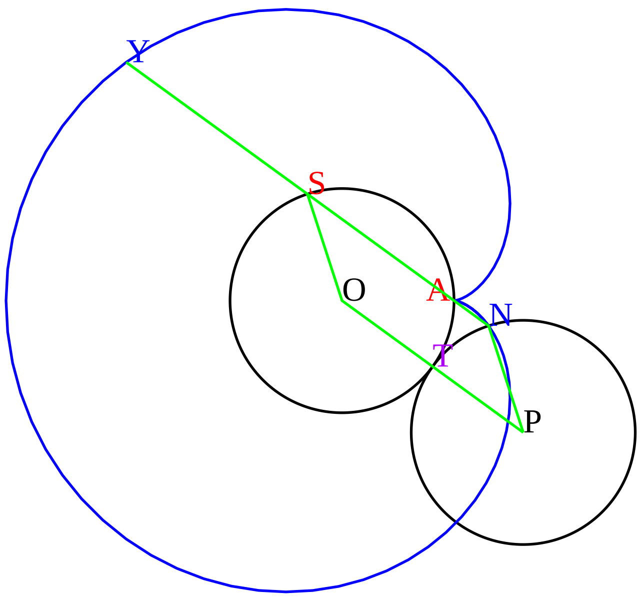
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



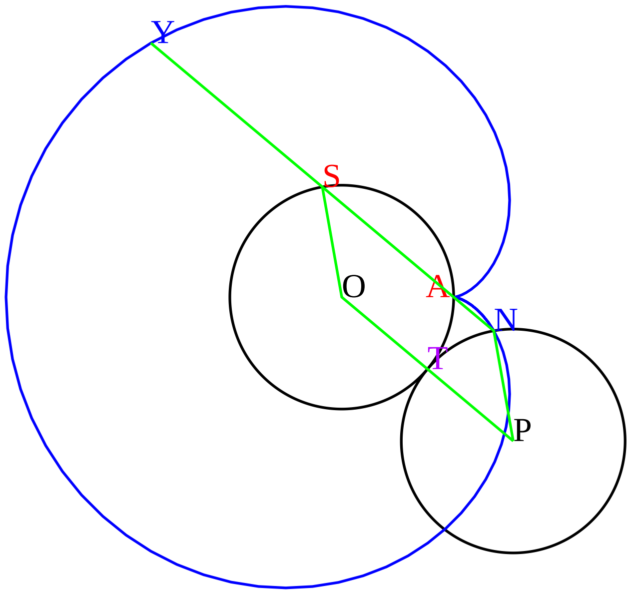
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



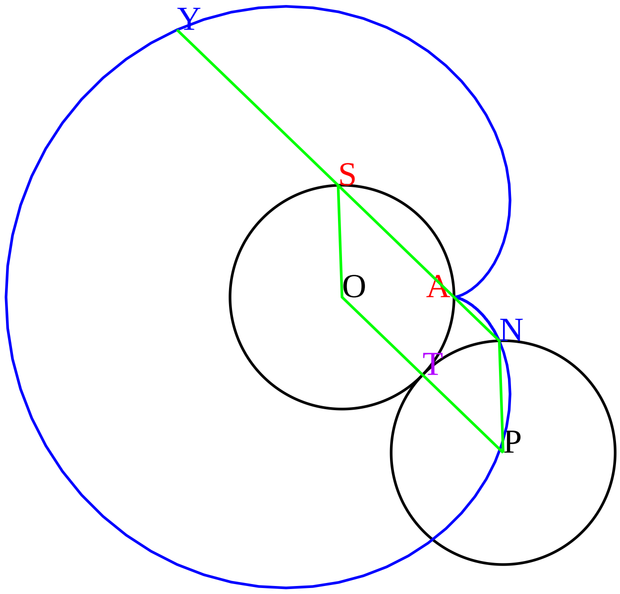
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



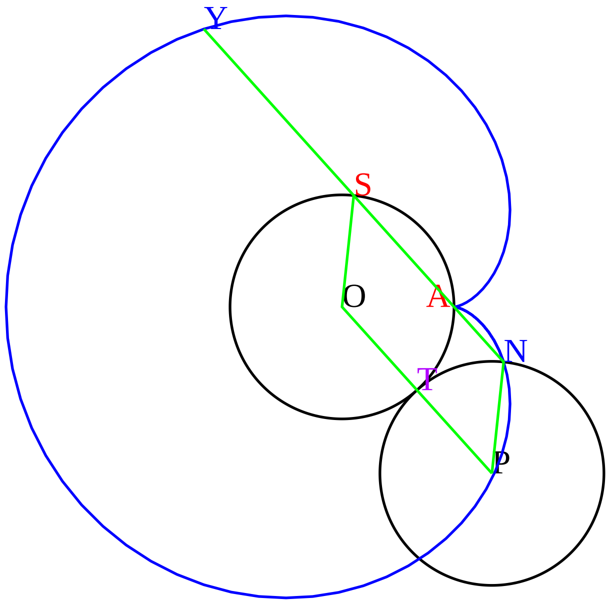
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



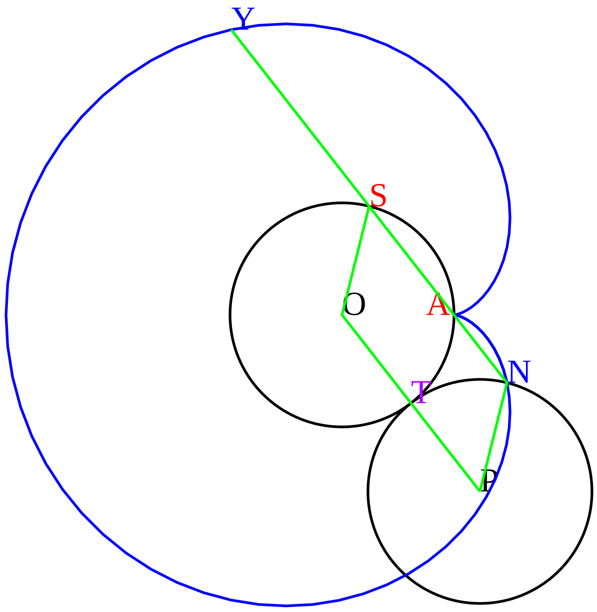
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



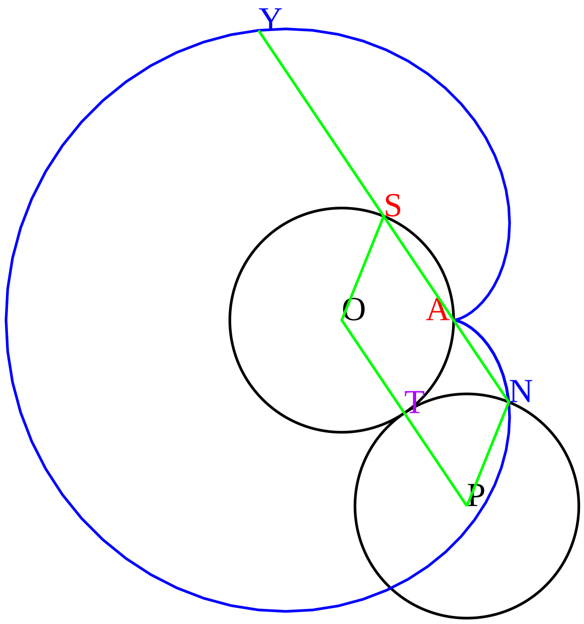
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



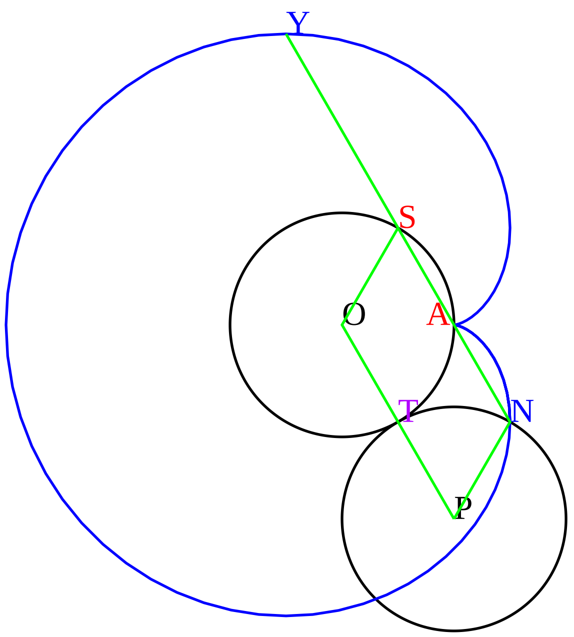
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



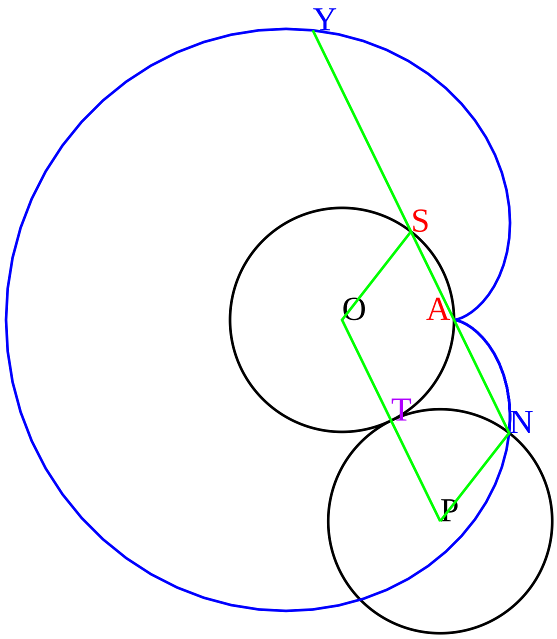
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



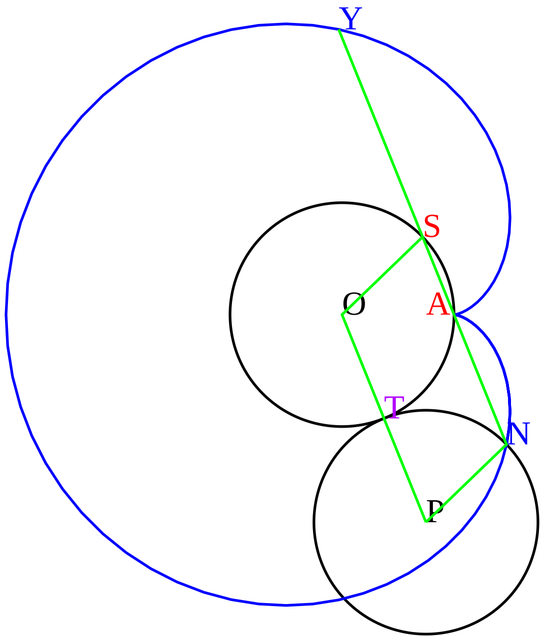
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



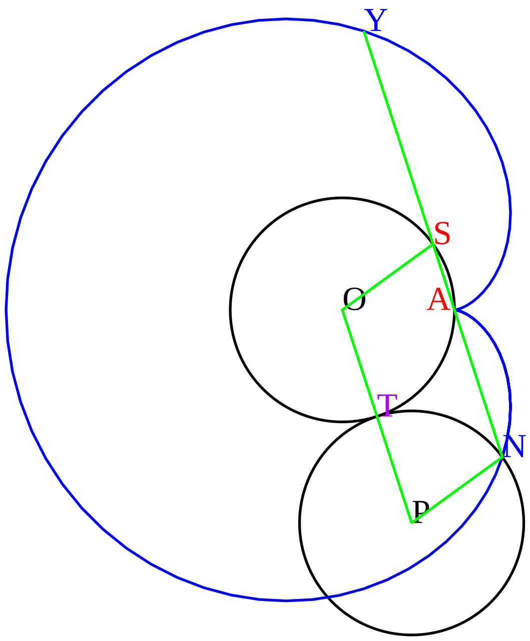
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



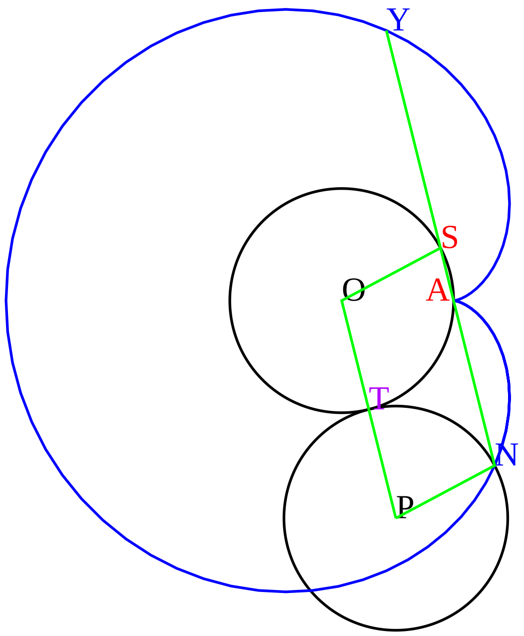
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



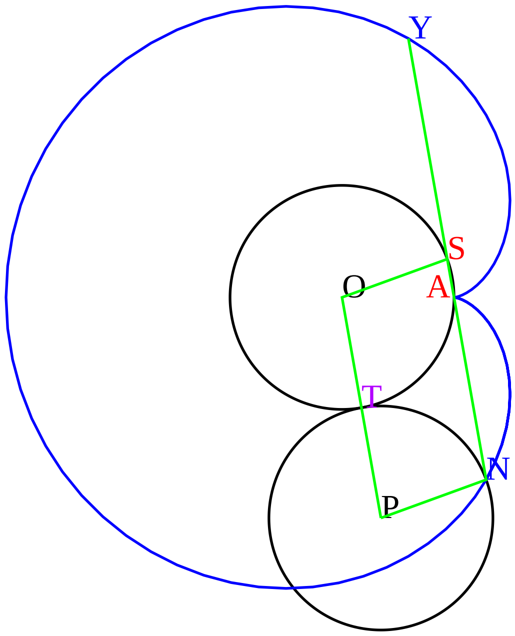
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



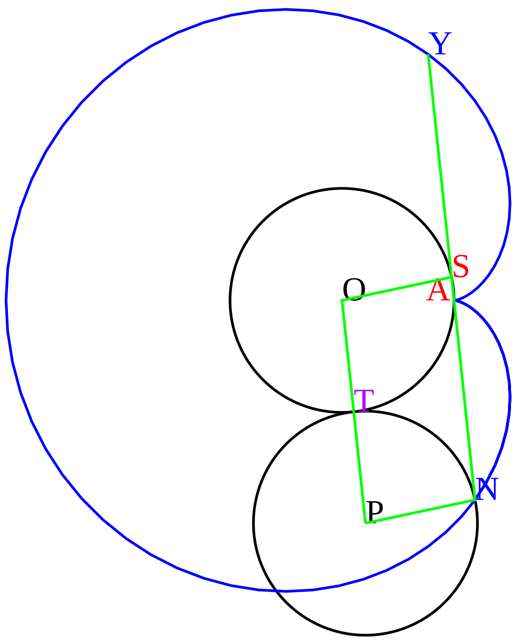
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



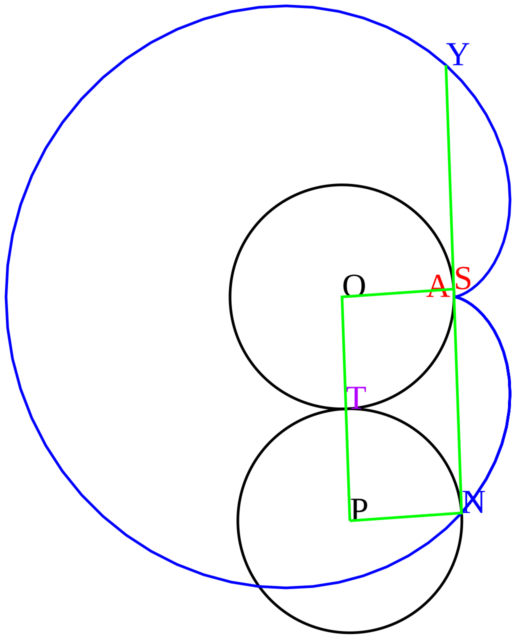
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



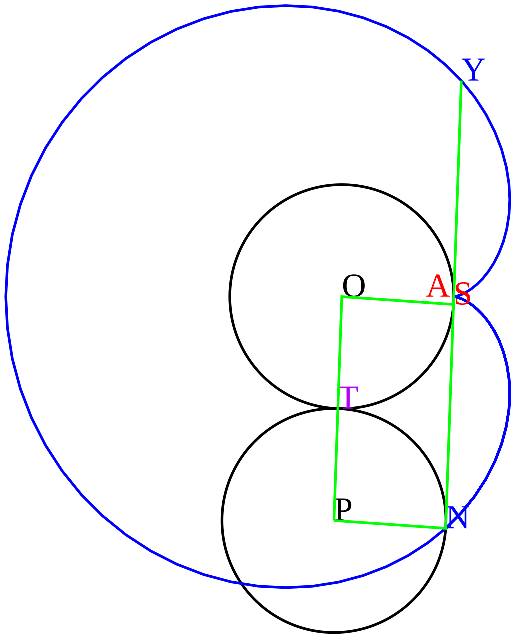
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



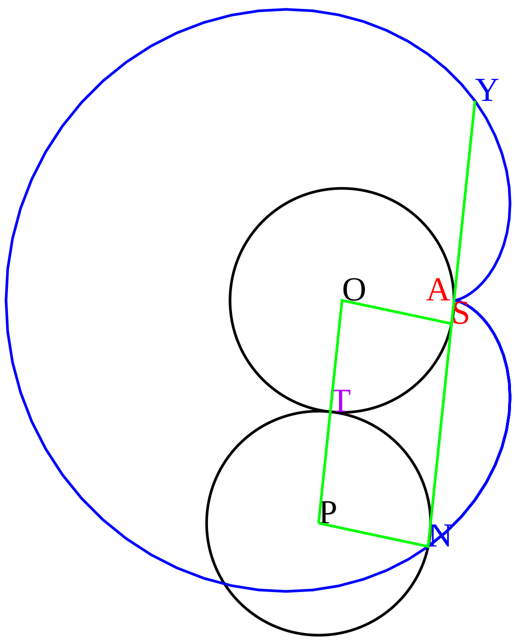
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



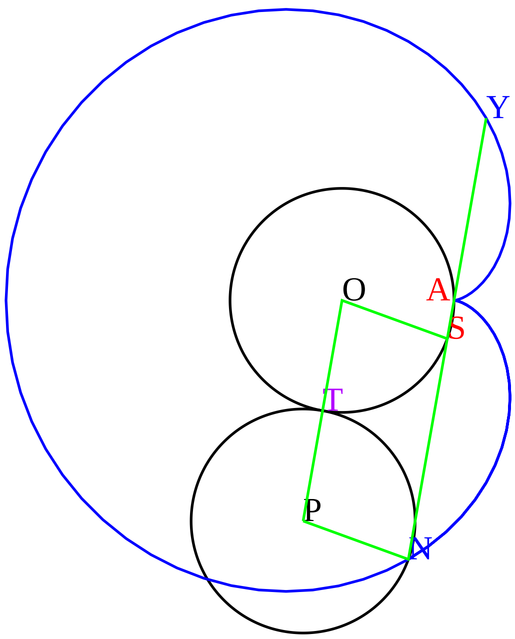
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



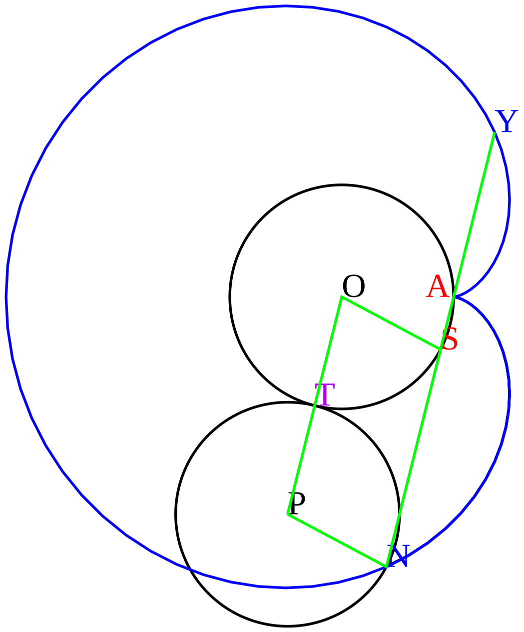
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



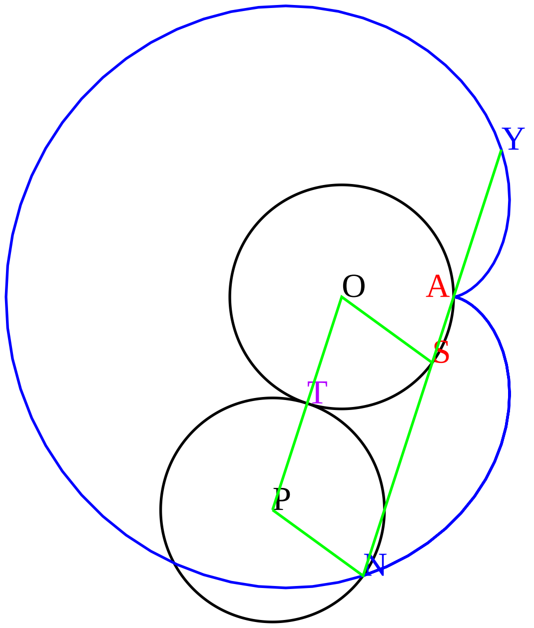
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



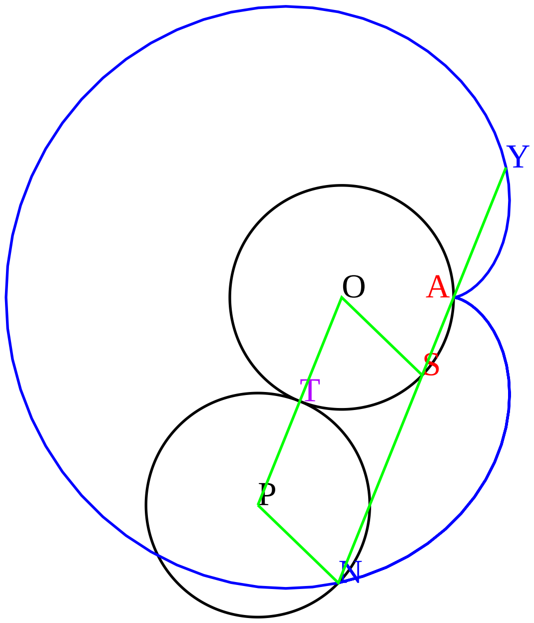
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



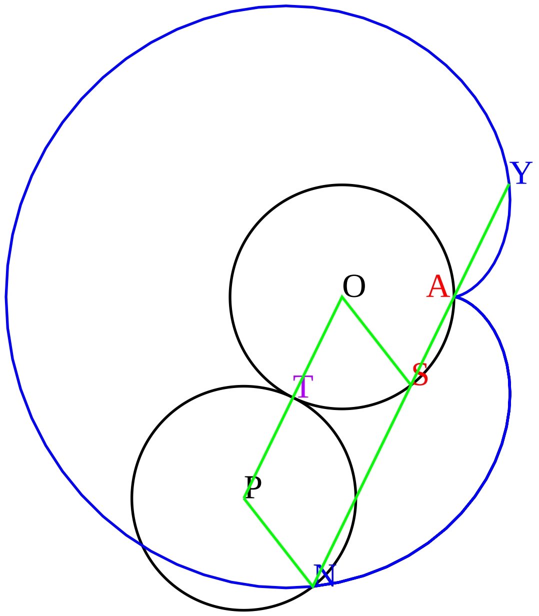
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



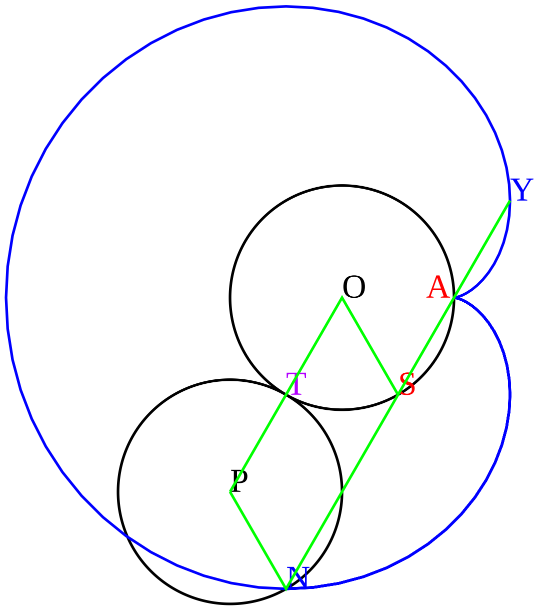
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



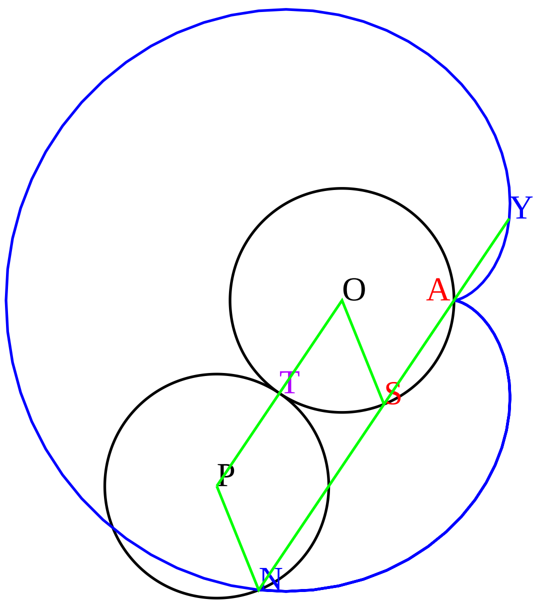
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



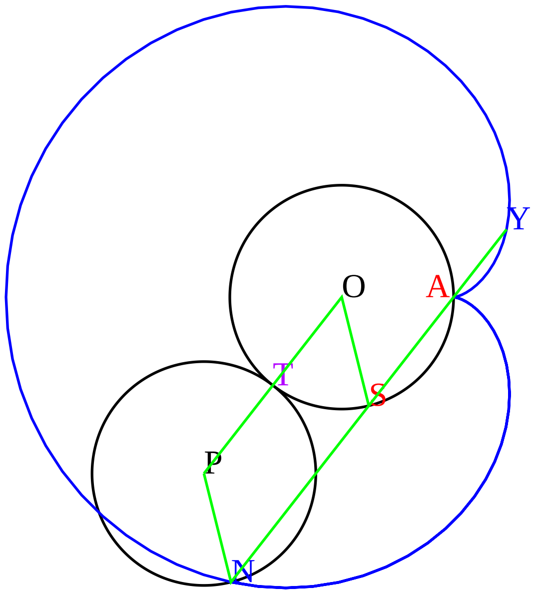
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



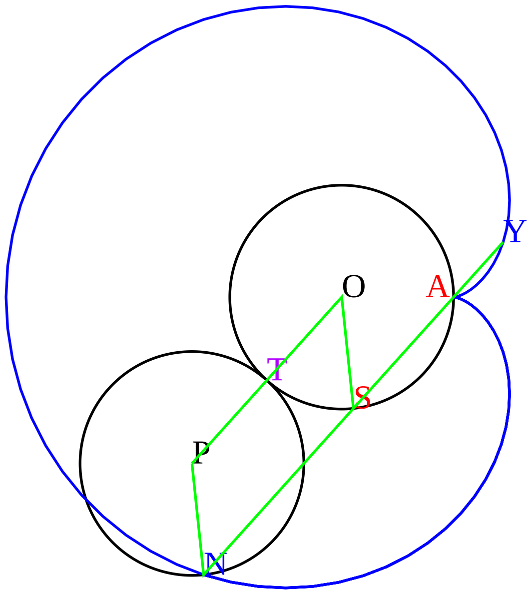
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



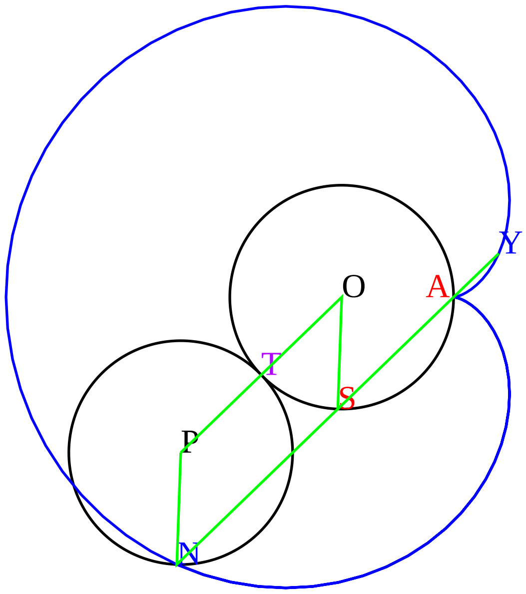
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



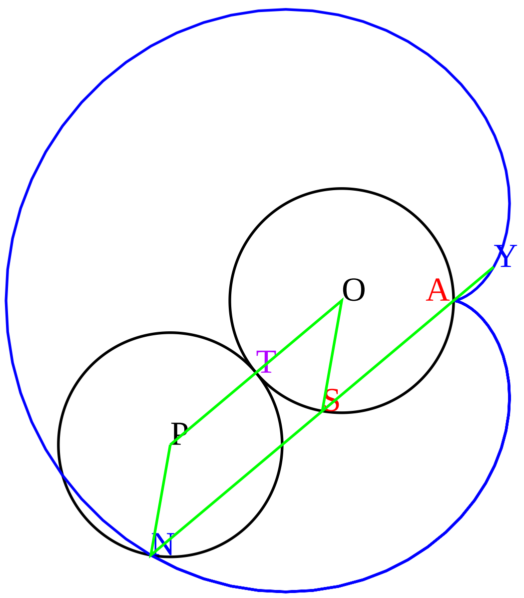
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



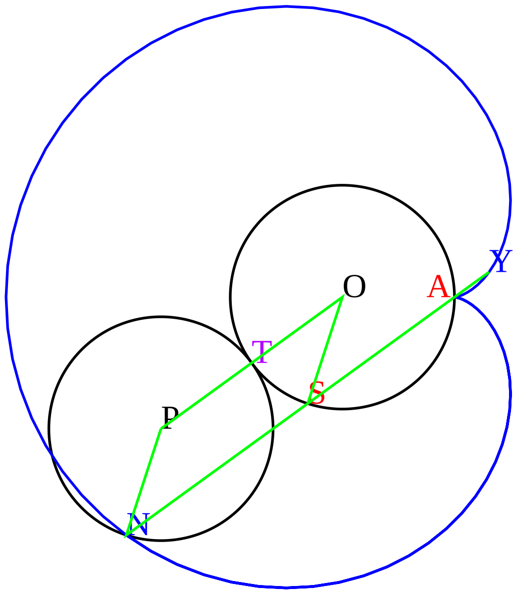
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



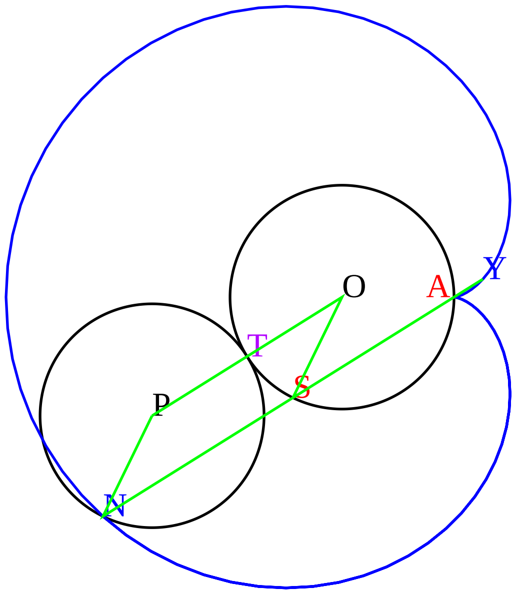
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



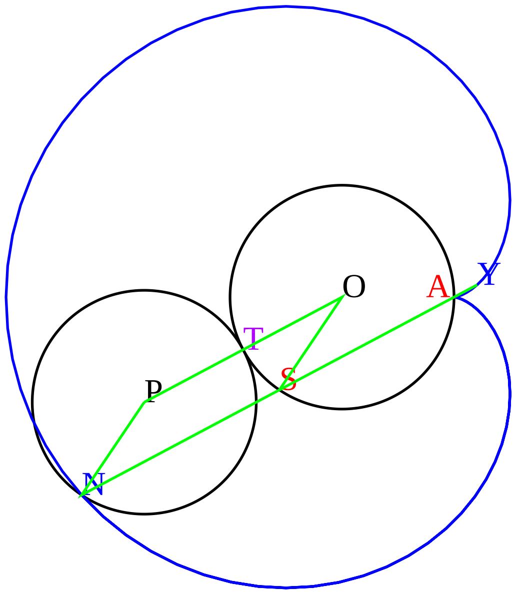
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



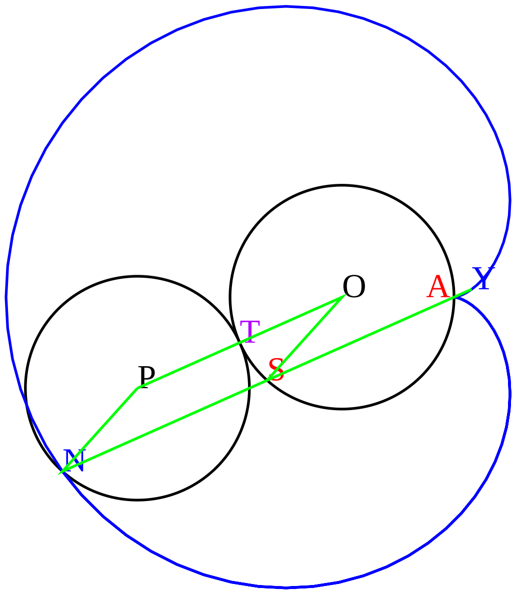
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



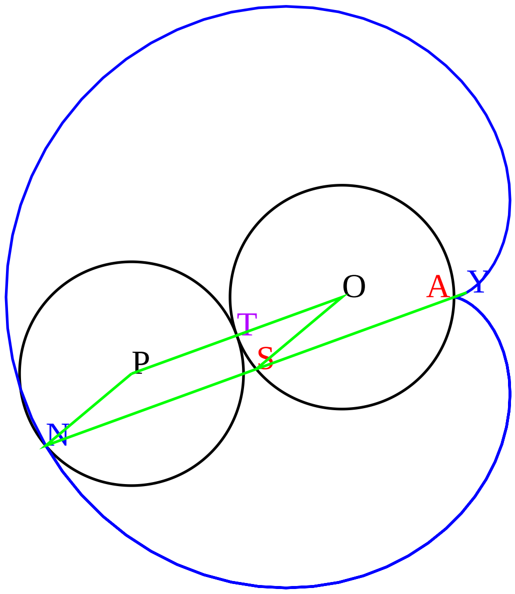
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



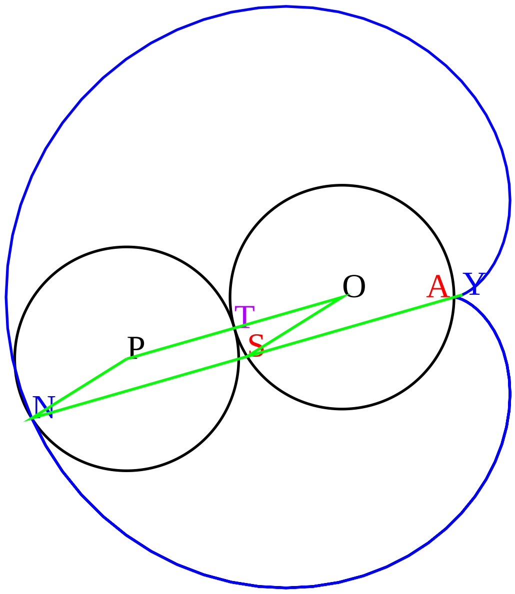
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



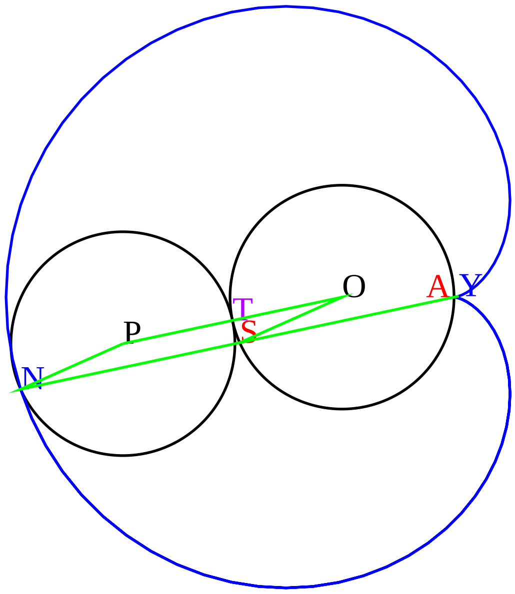
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



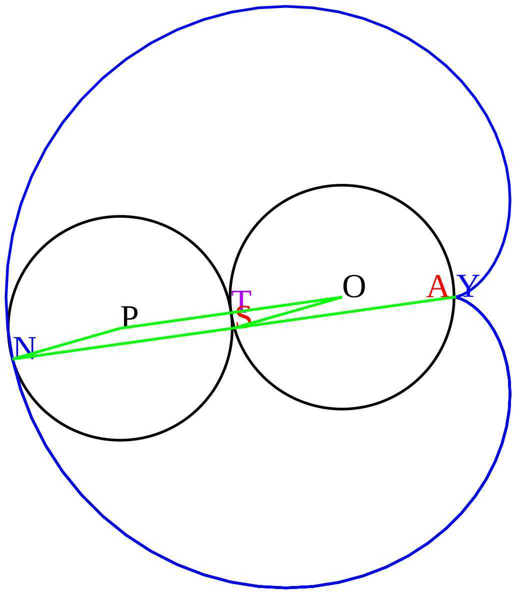
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



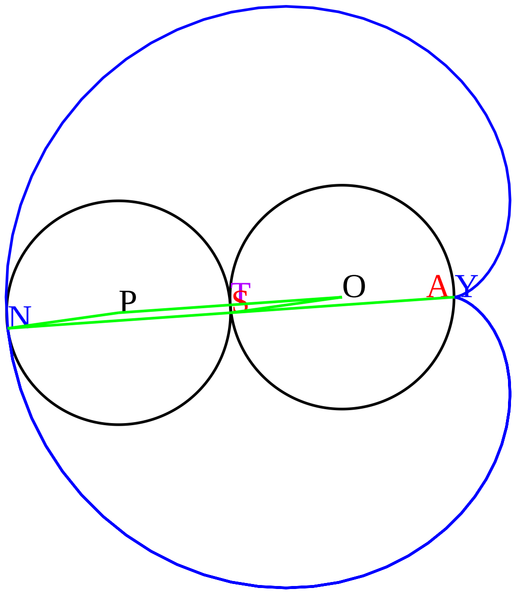
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



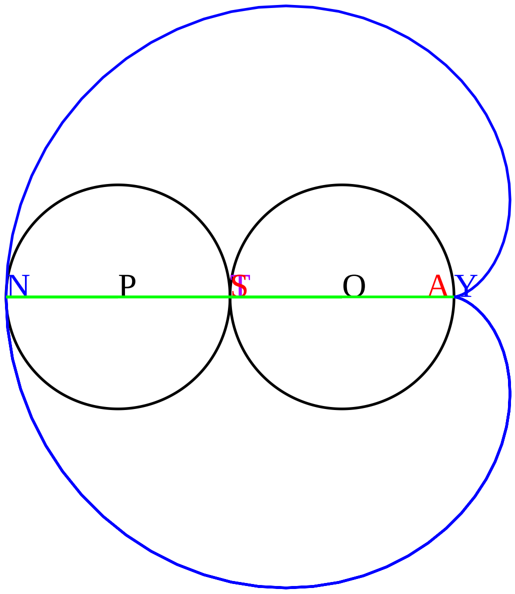
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



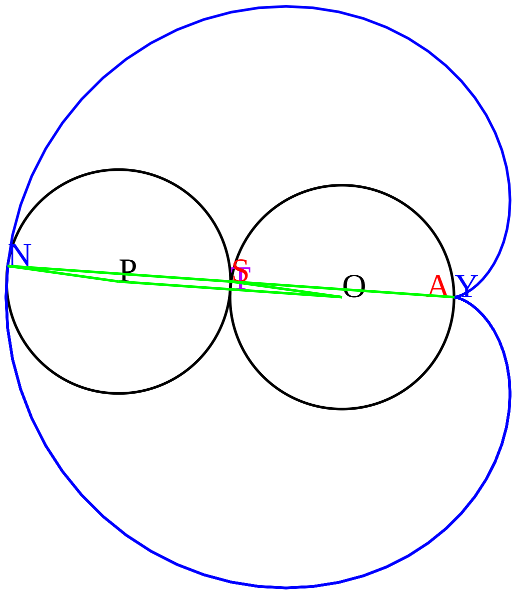
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



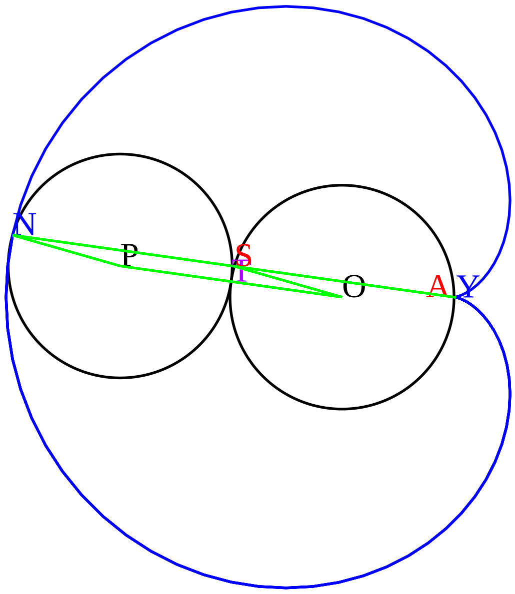
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



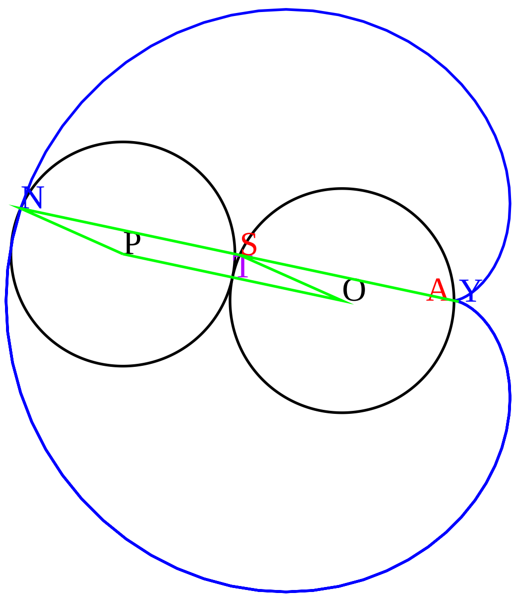
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



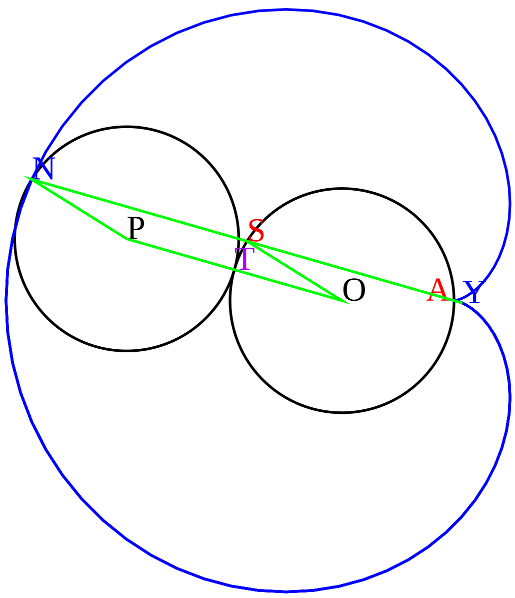
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



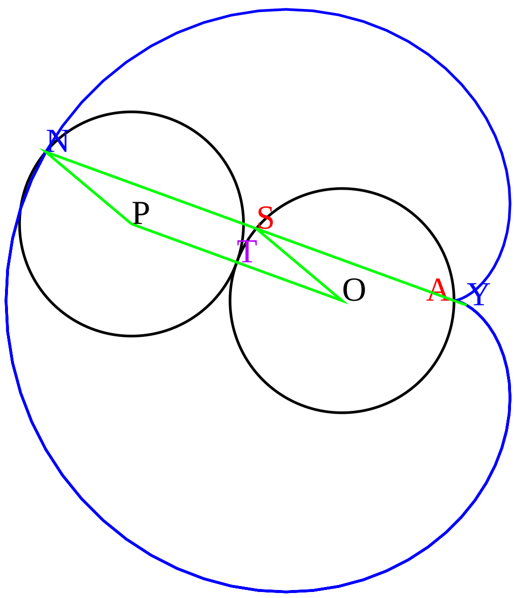
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



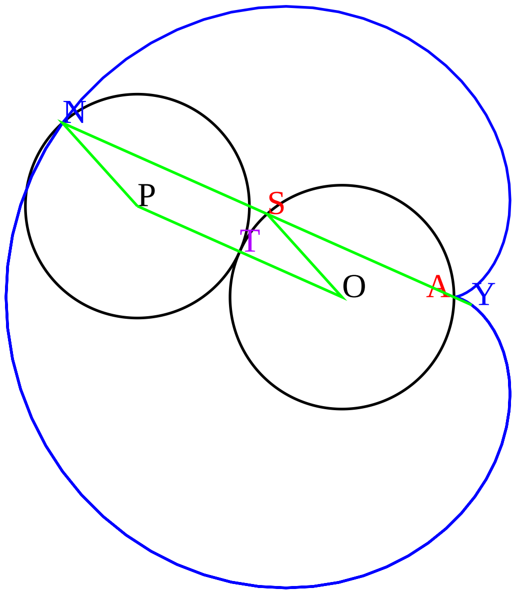
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



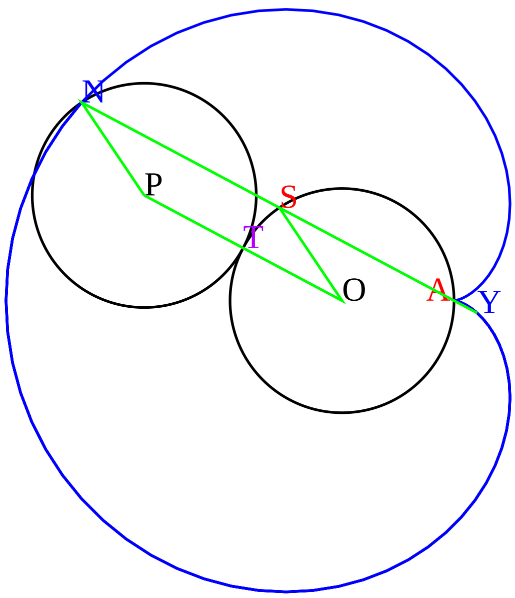
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



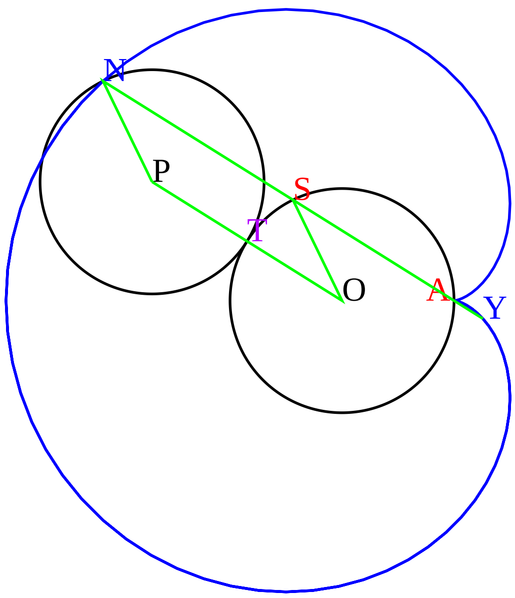
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



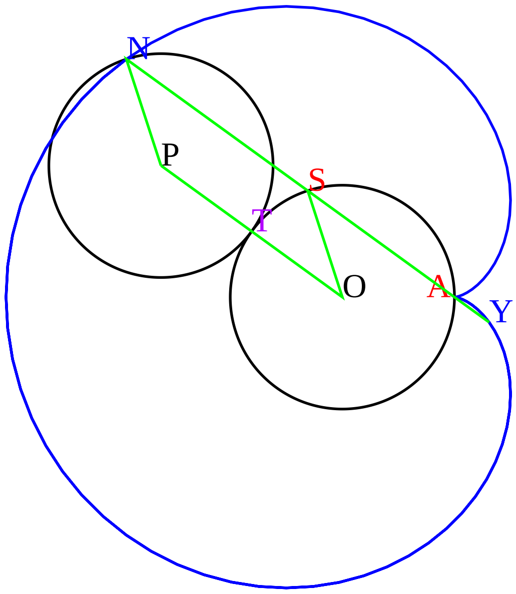
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



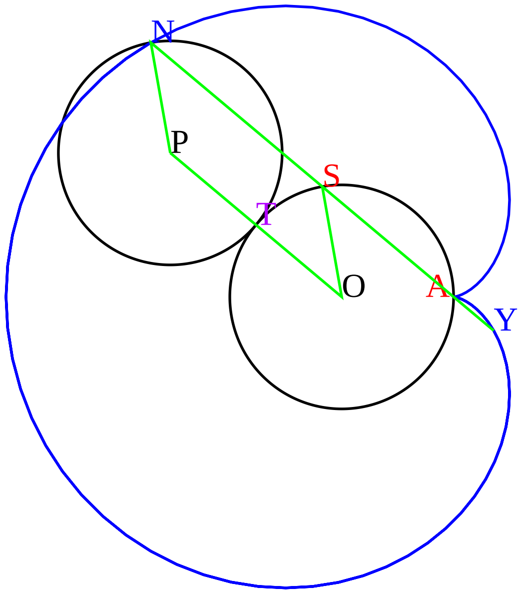
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



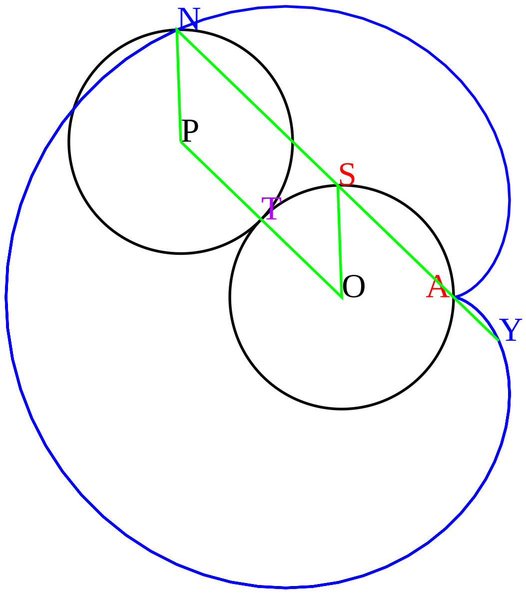
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



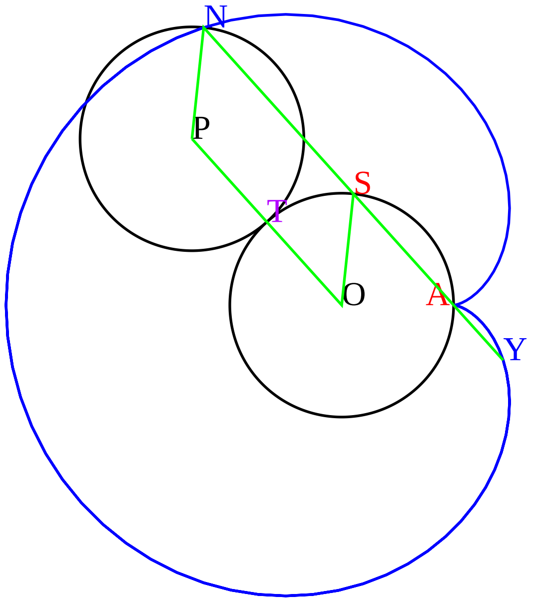
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



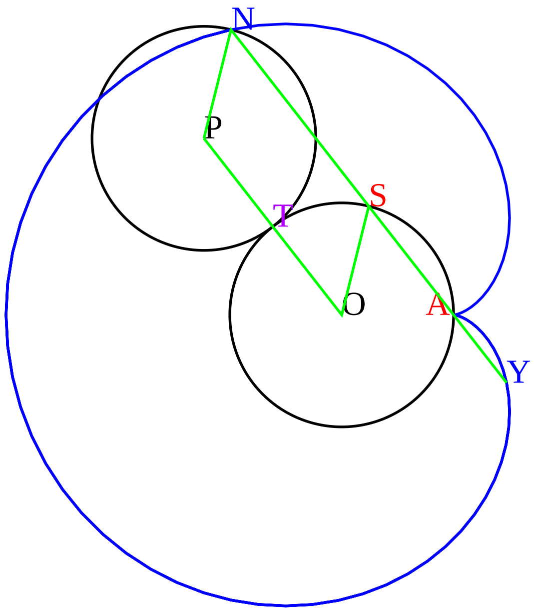
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



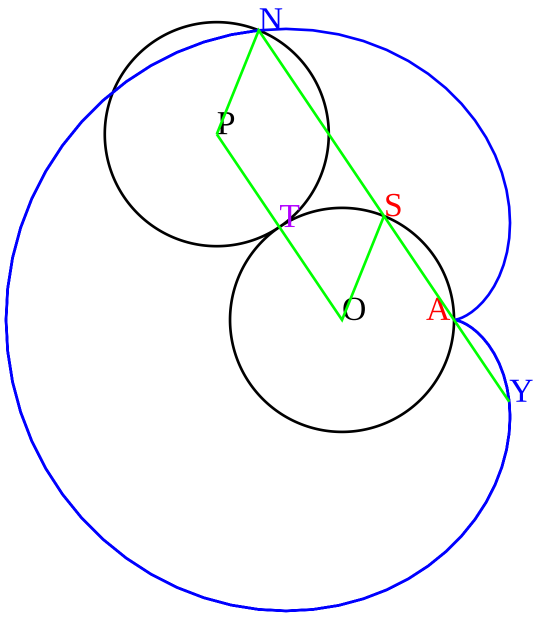
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



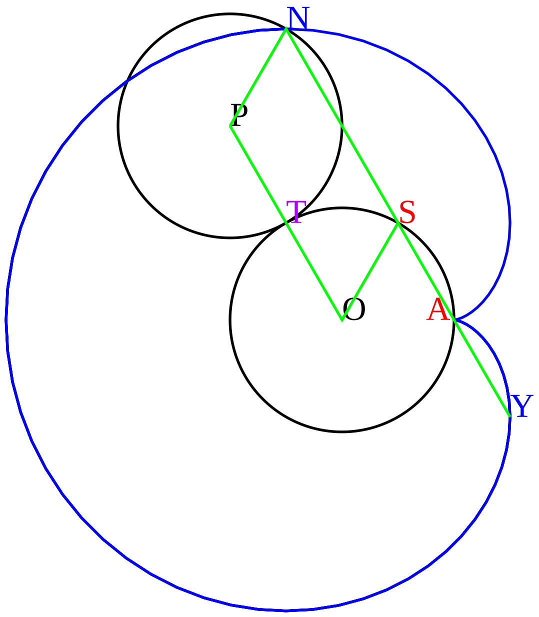
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



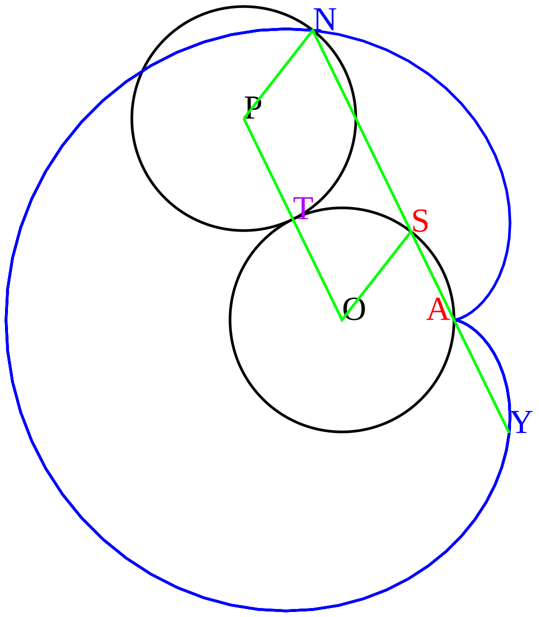
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



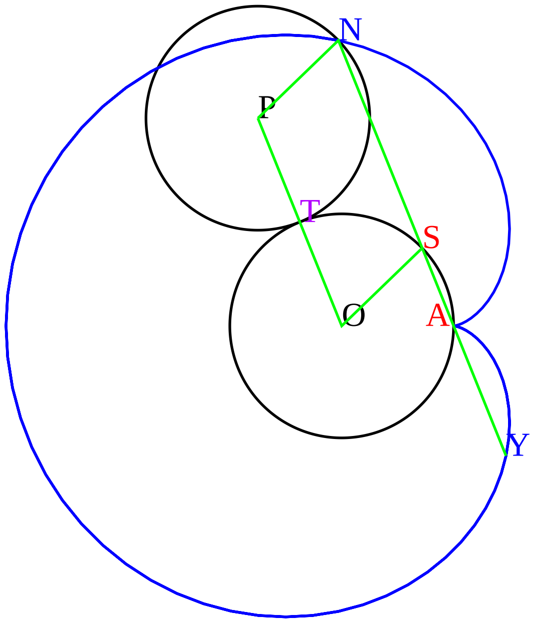
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



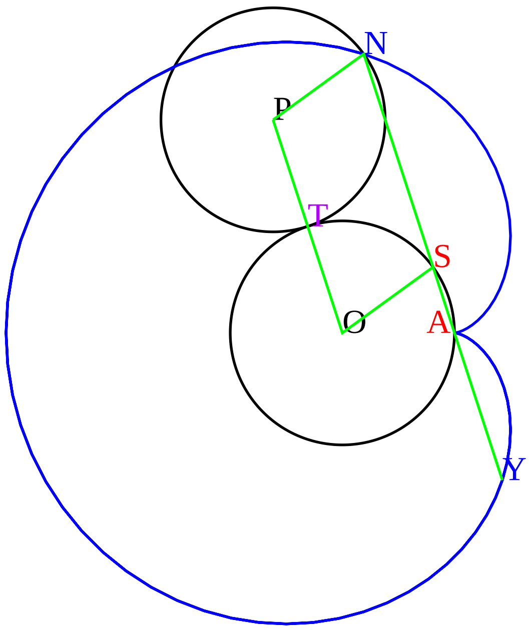
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



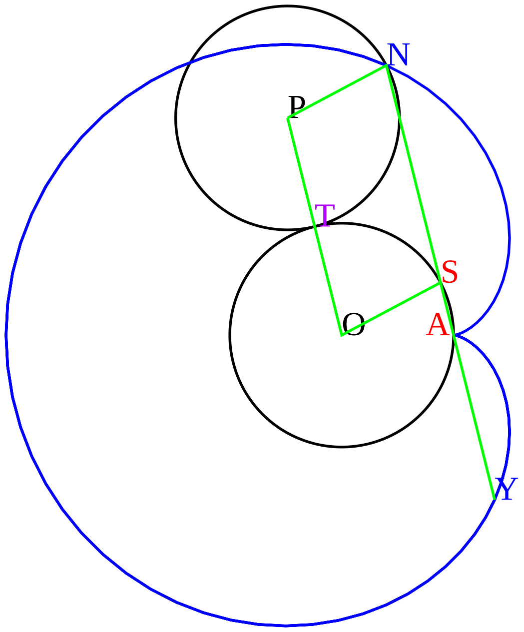
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



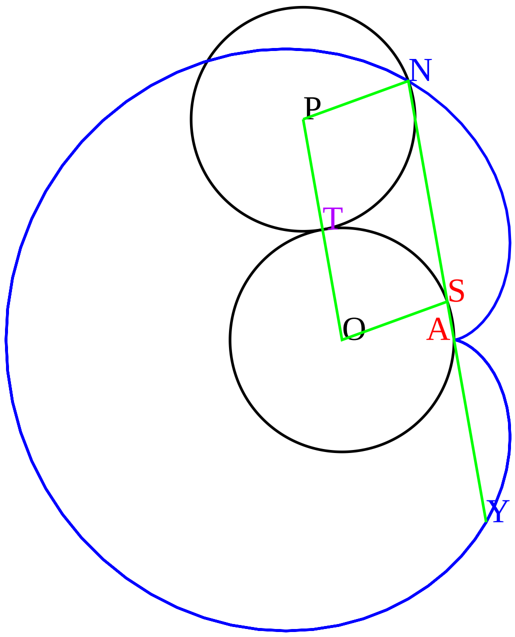
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



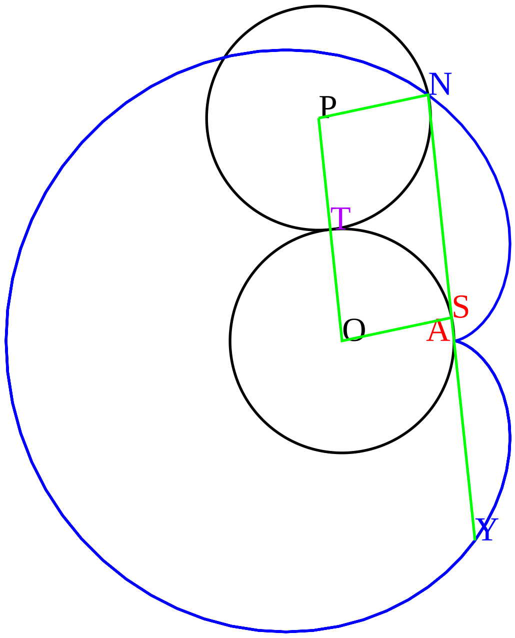
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



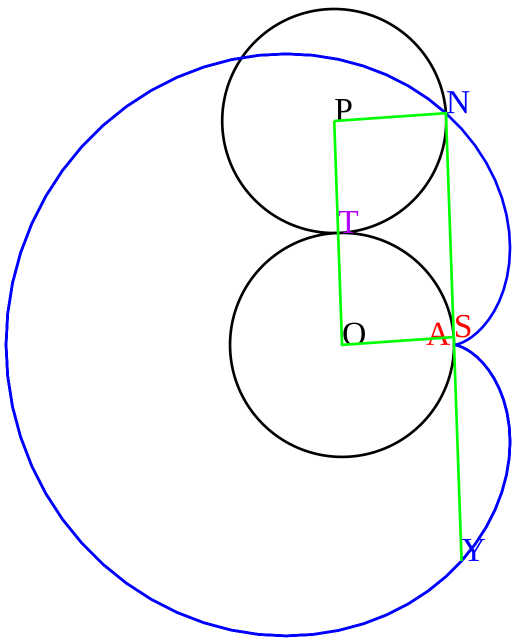
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



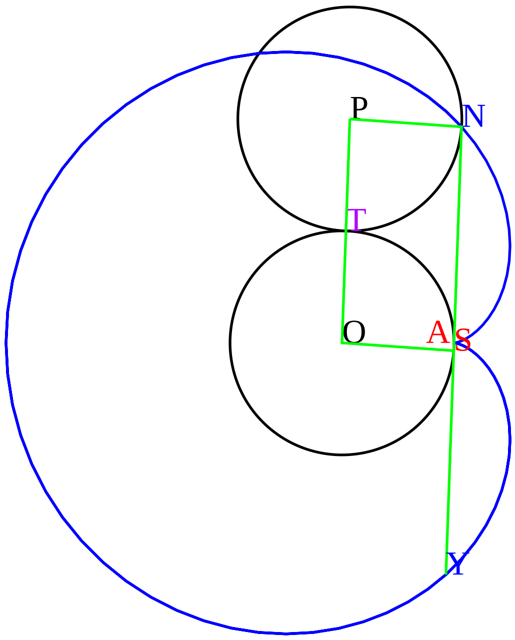
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



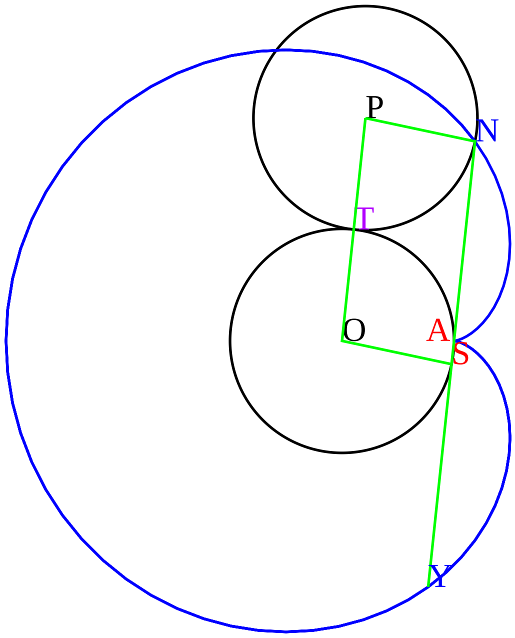
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



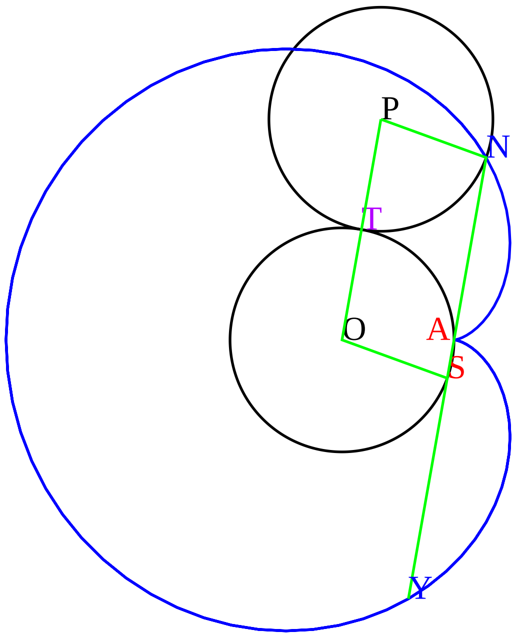
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



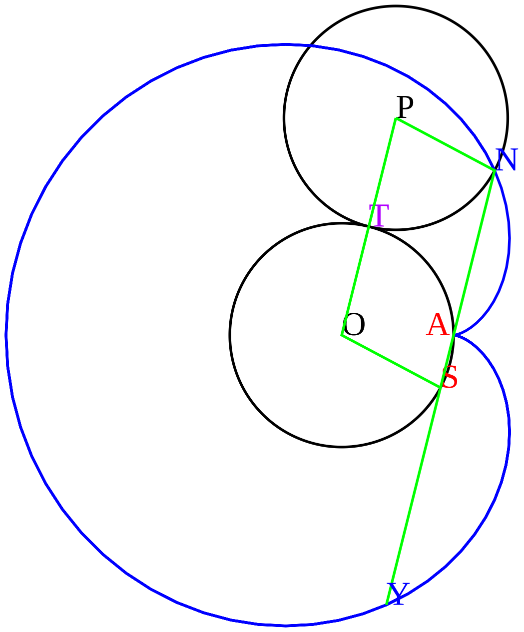
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



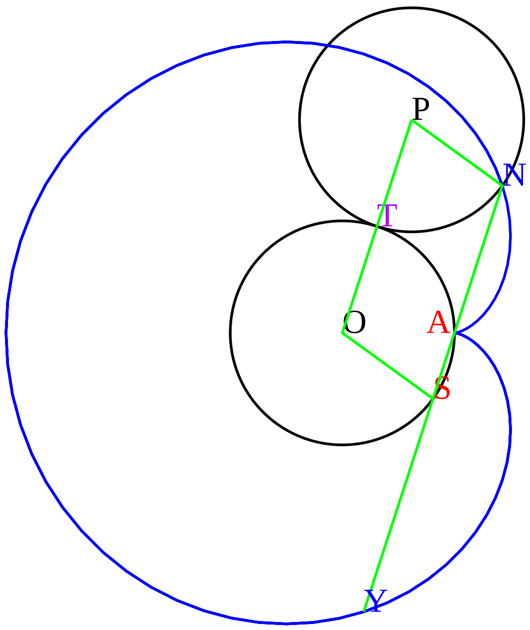
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



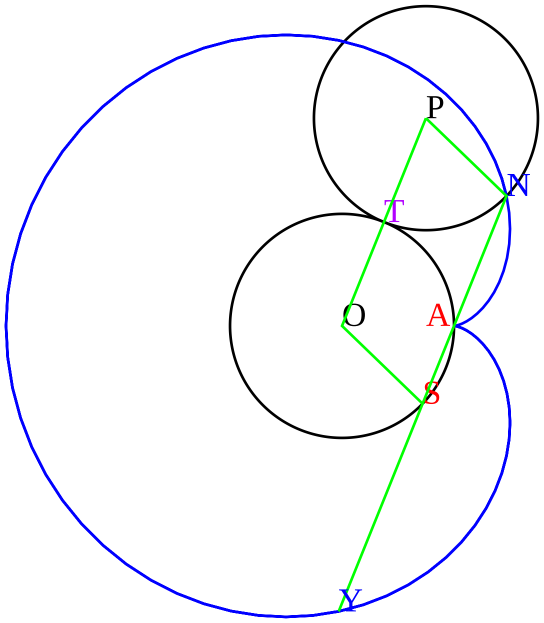
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



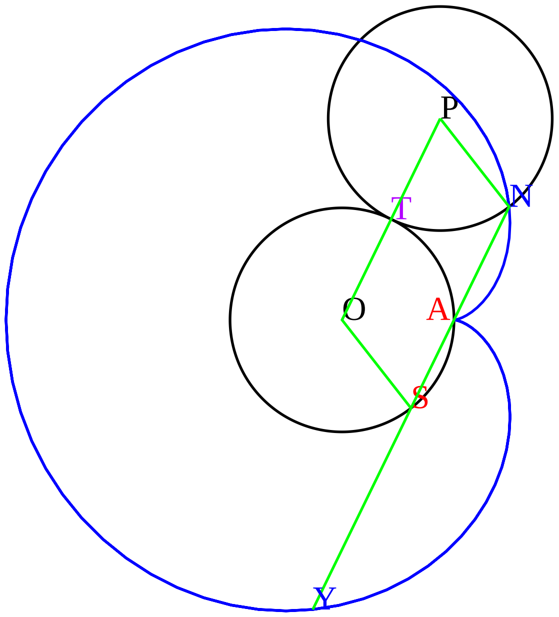
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



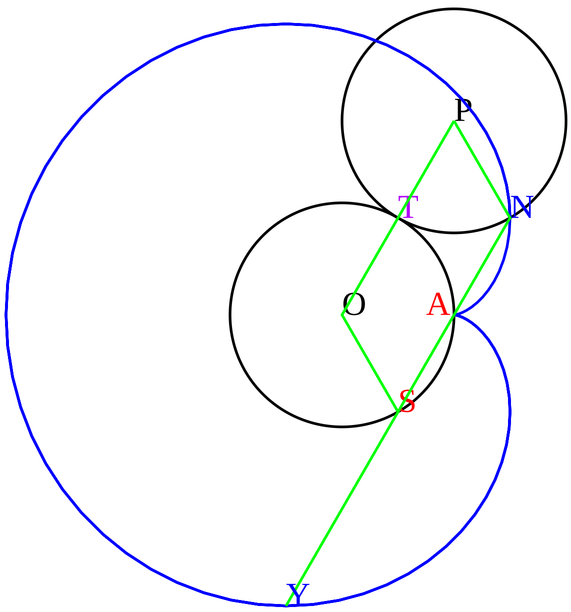
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



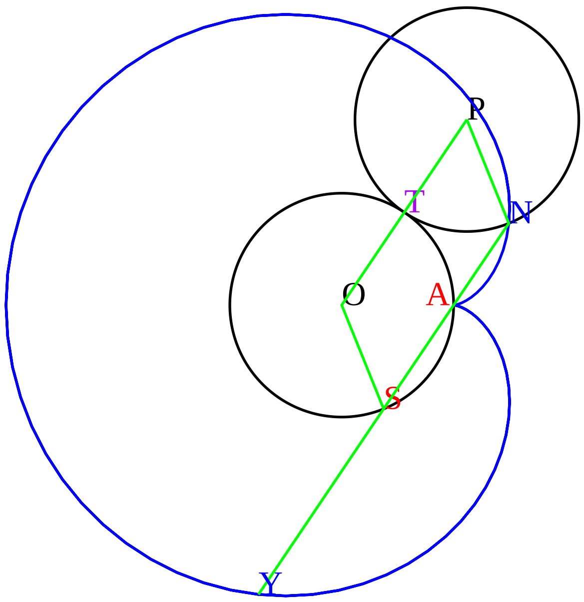
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



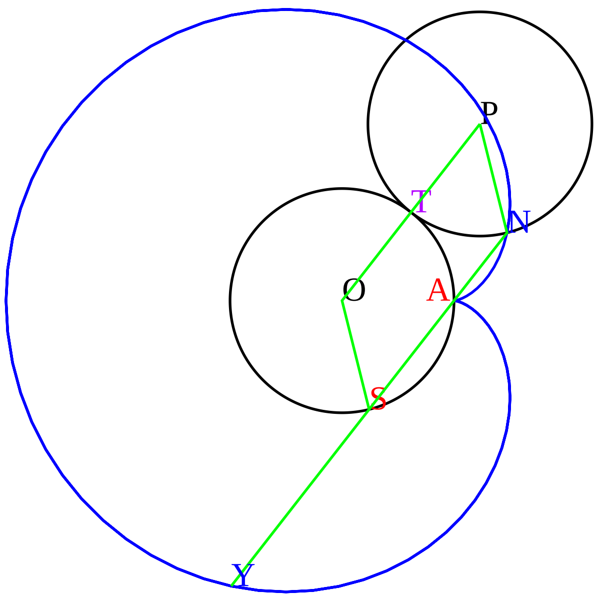
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



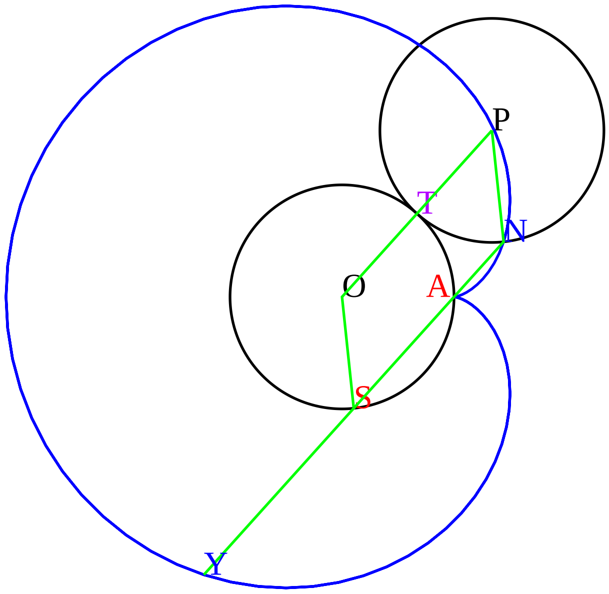
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



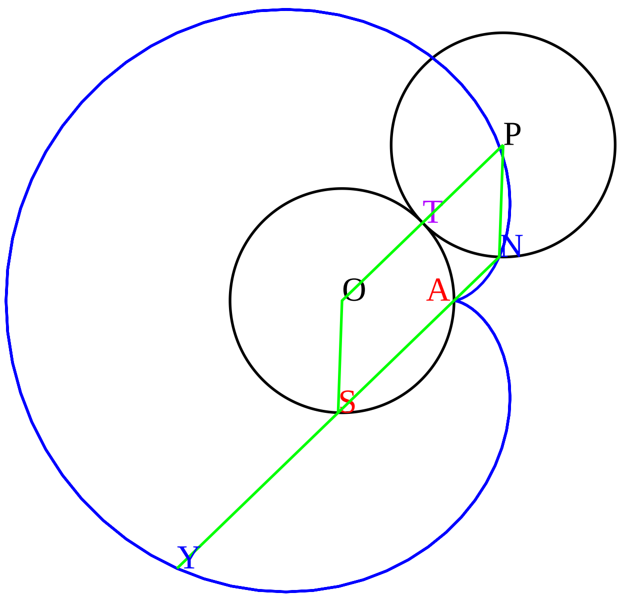
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



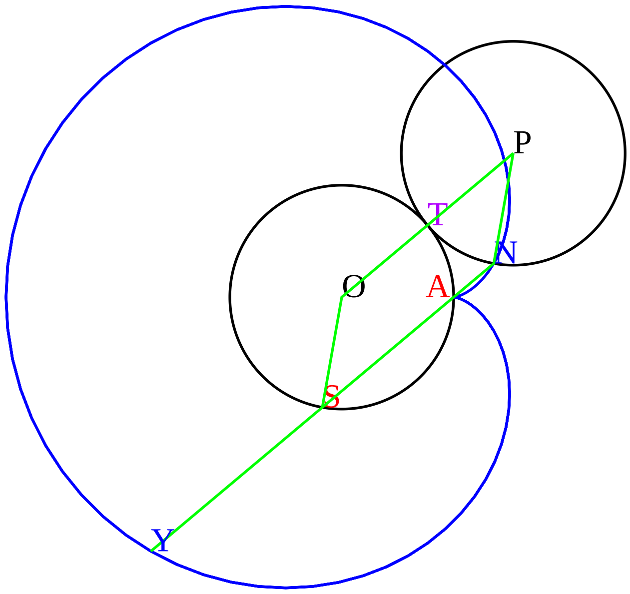
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



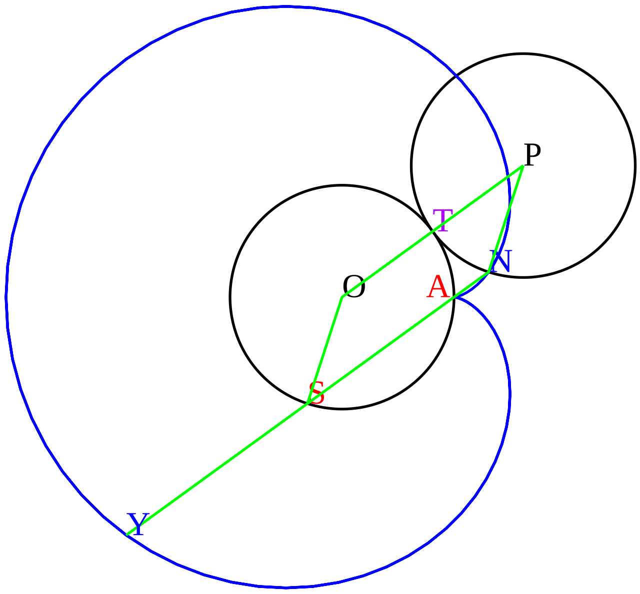
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



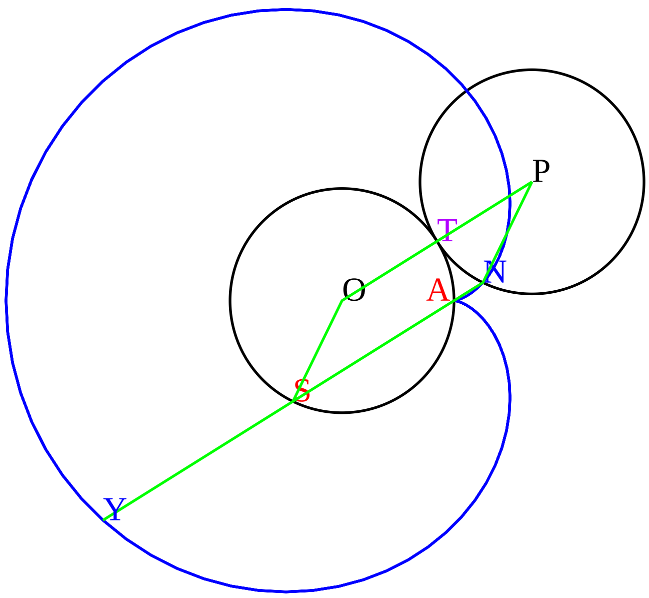
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



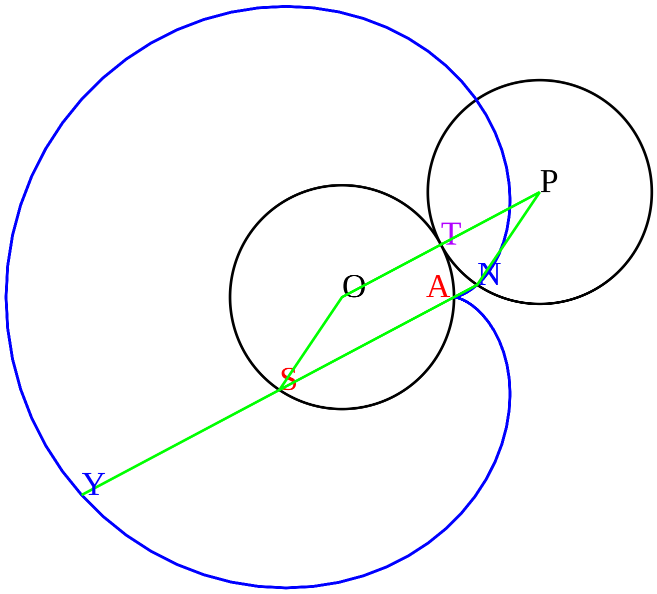
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



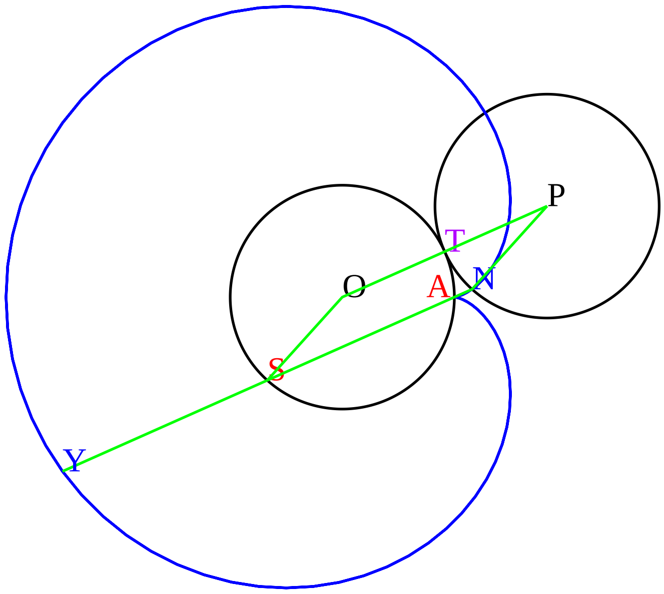
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



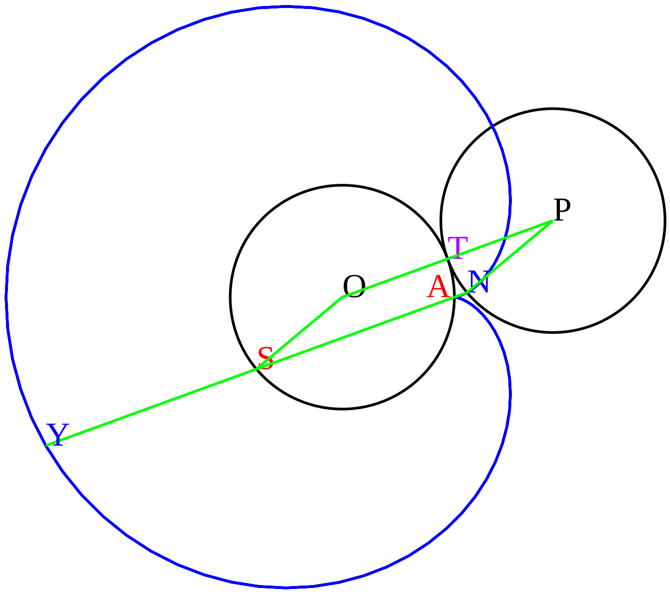
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



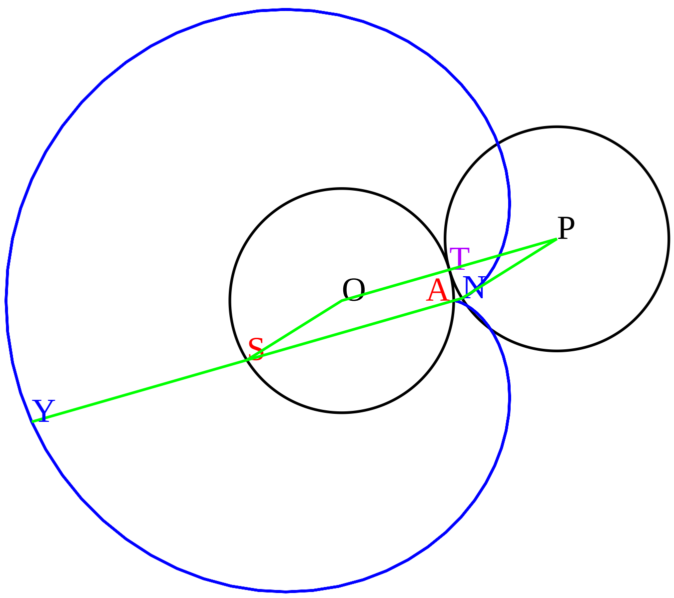
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



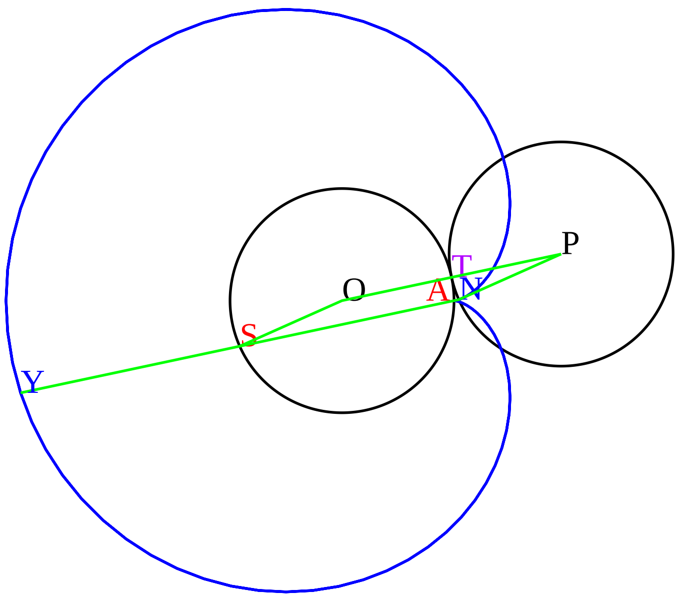
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



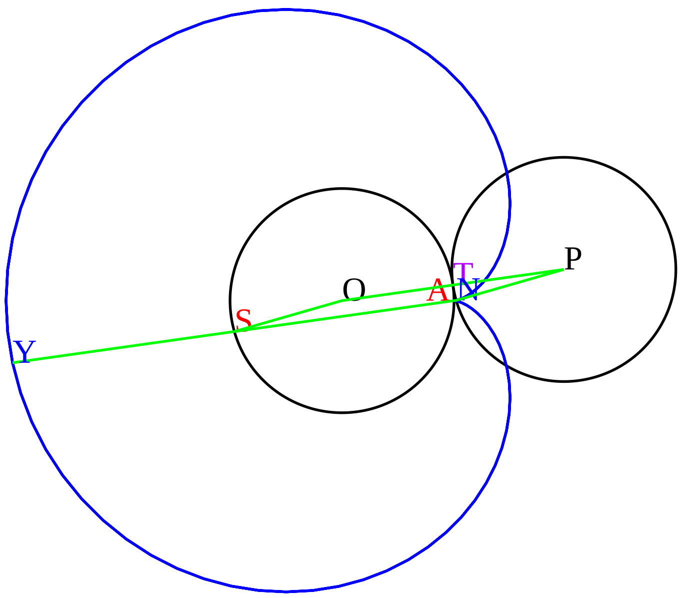
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



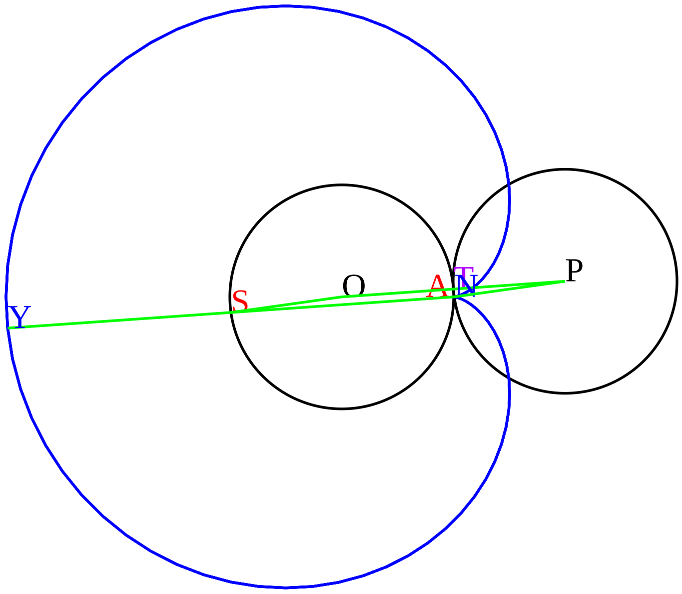
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



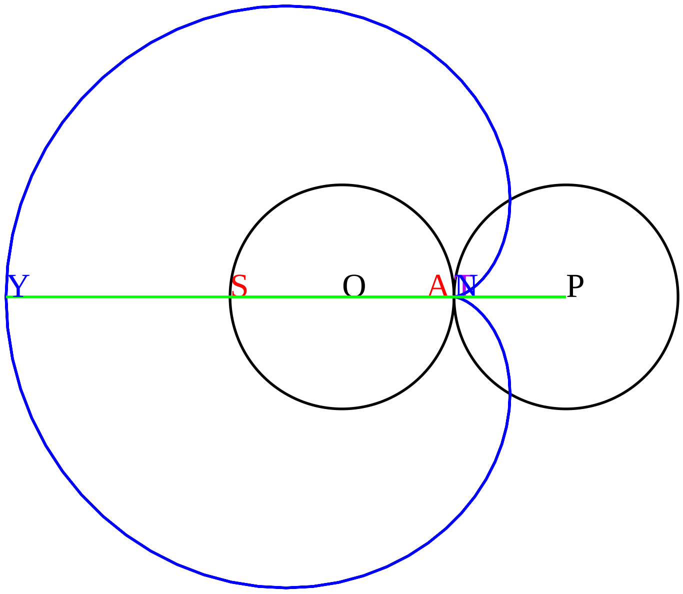
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



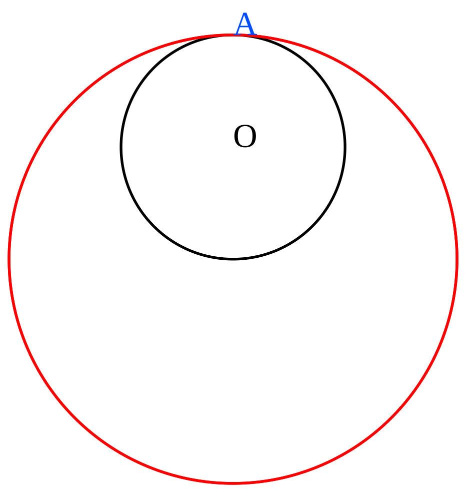
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



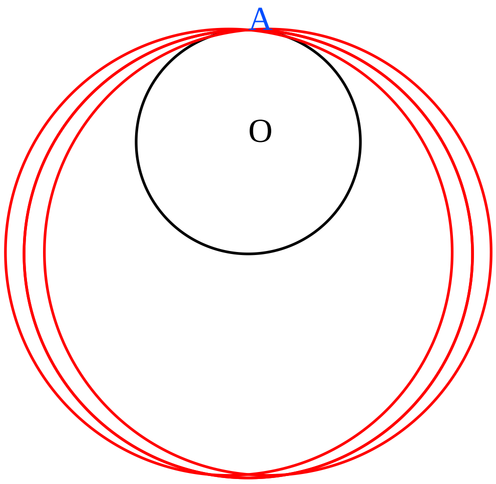
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



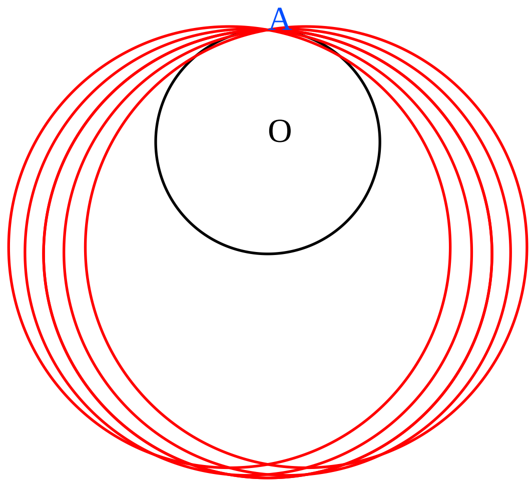
To obtain SA, extend each beyond A to the total length of twice radius of the circle. As S moves around the circle, the other end N traces a cardioid. To obtain the whole cardioid, double the length of NS by extending it beyond S. The second end Y will trace the same cardioid. All YN through the point A have the same length which is 4 times the radius of the circles. S is the midpoint of YN.



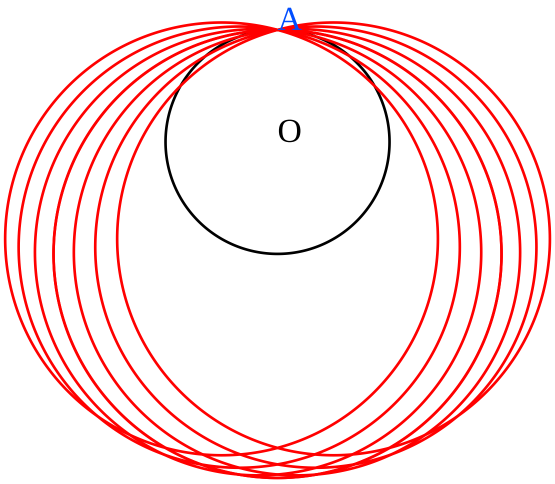
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



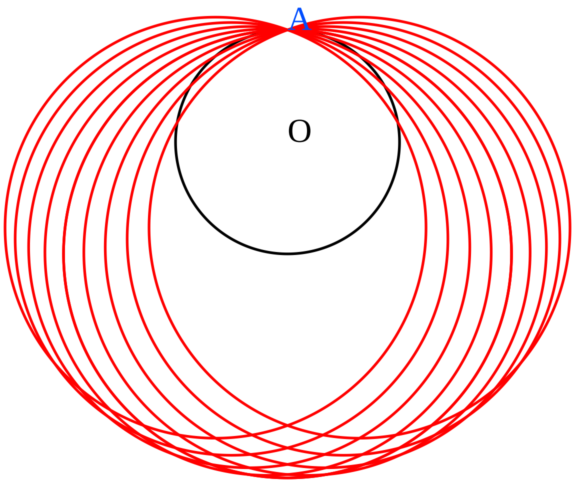
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



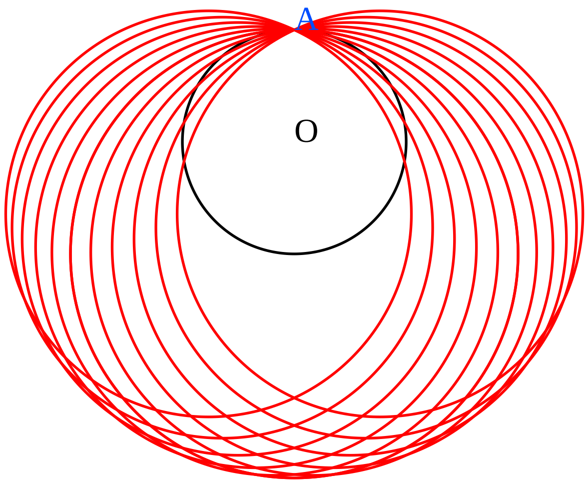
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



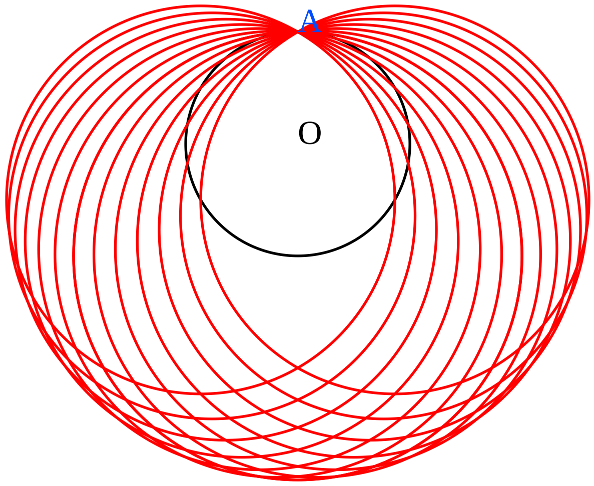
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



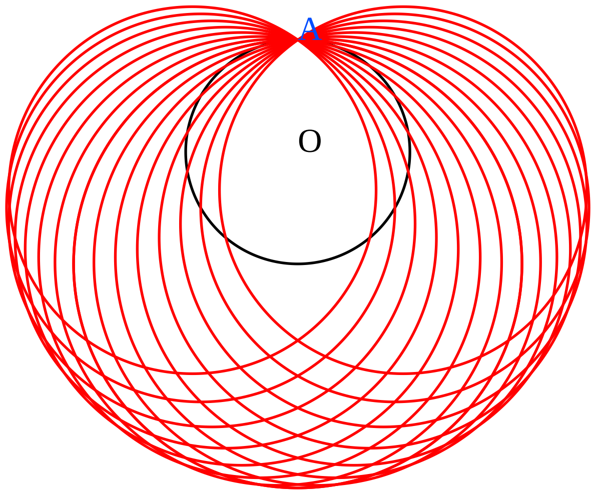
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



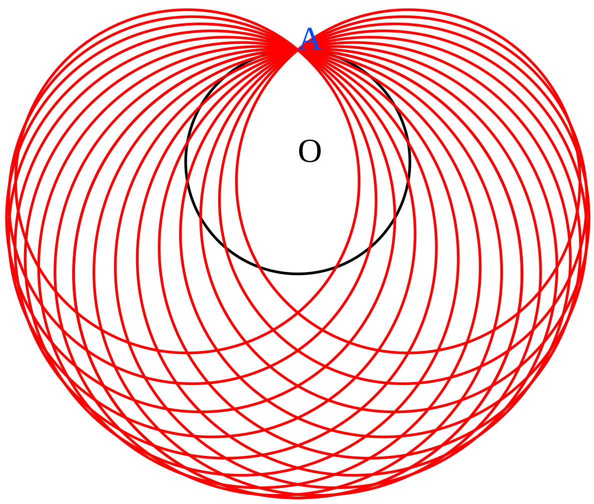
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



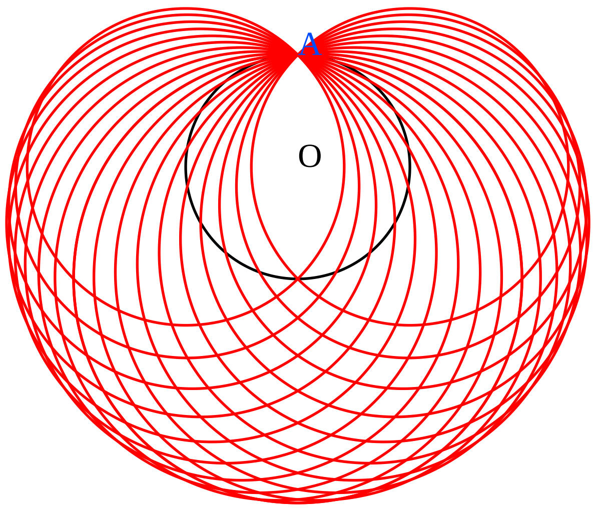
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



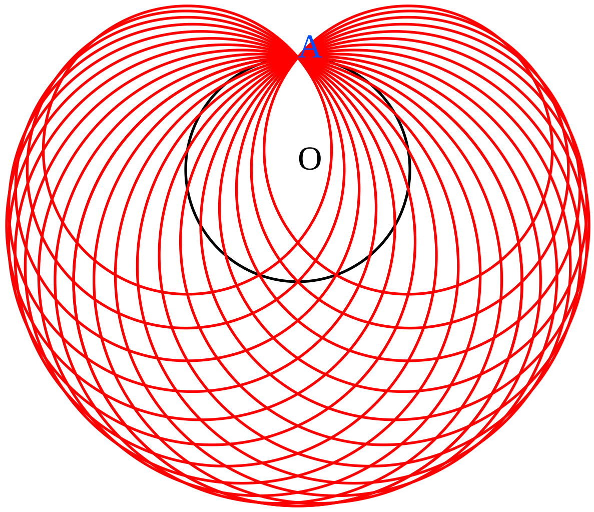
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



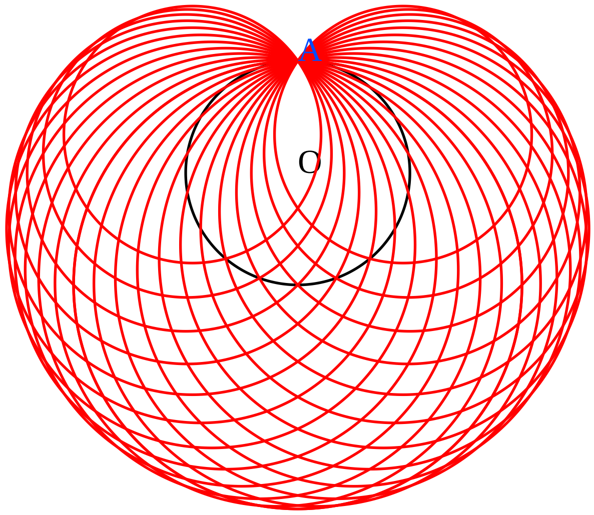
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



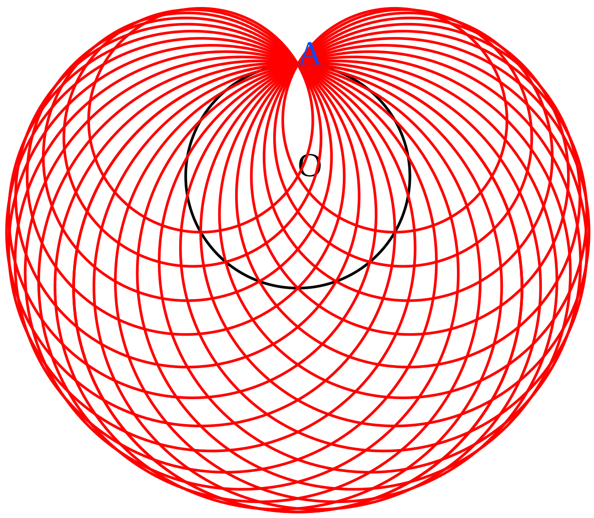
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



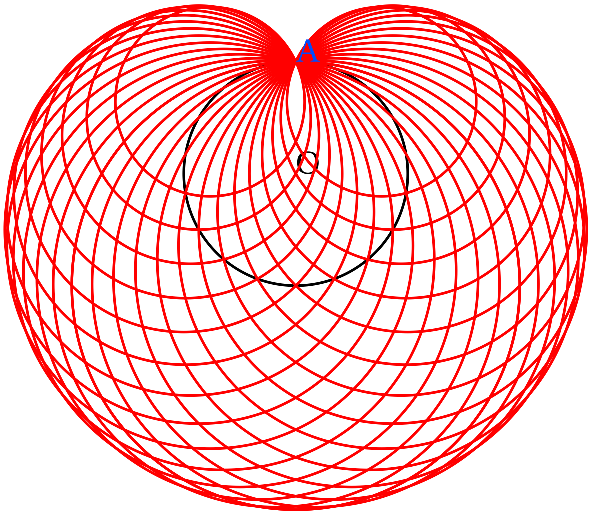
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



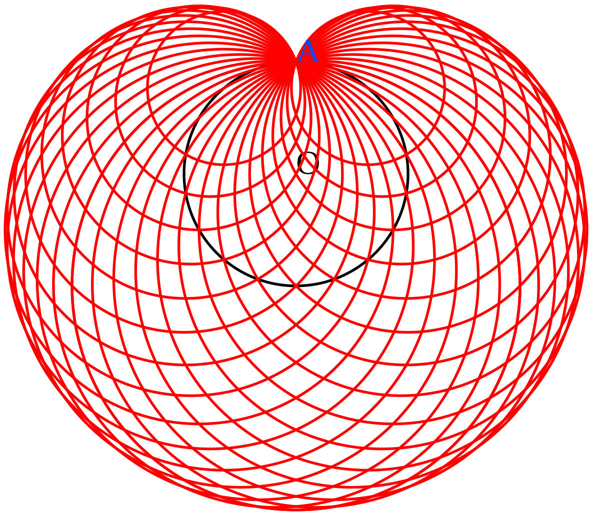
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



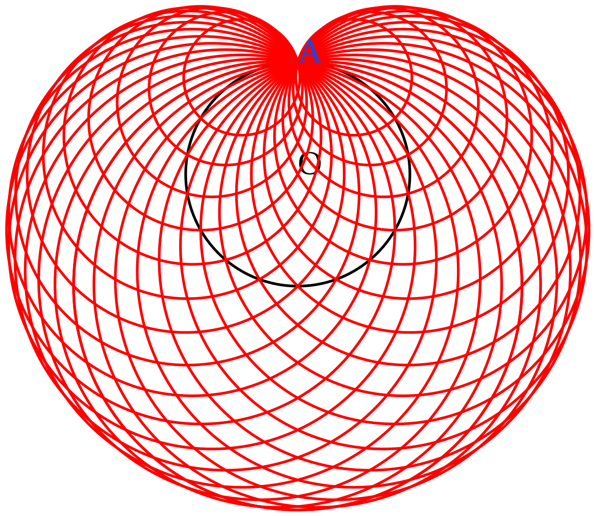
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



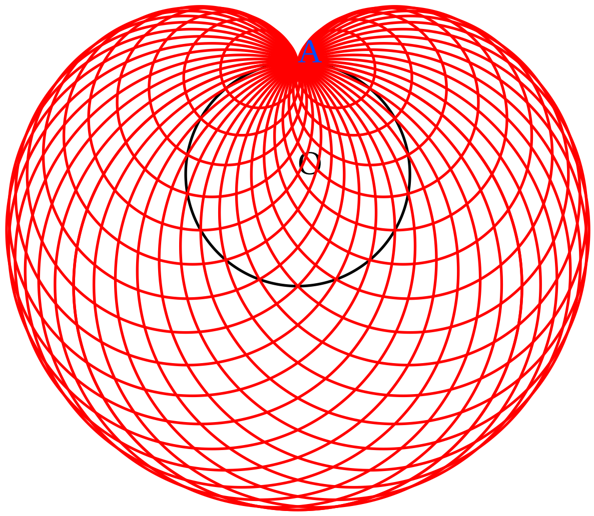
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



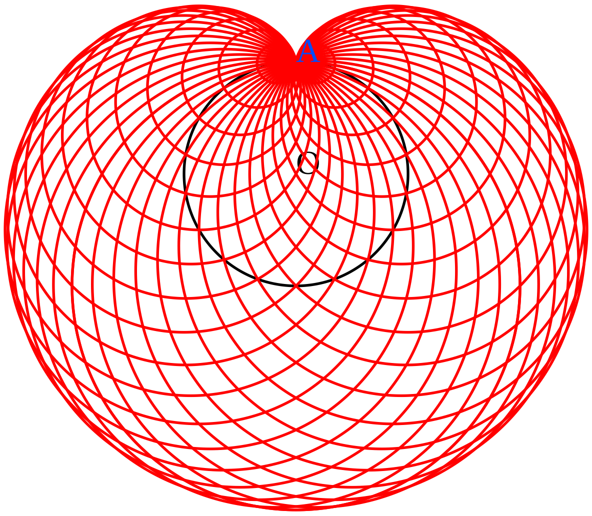
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



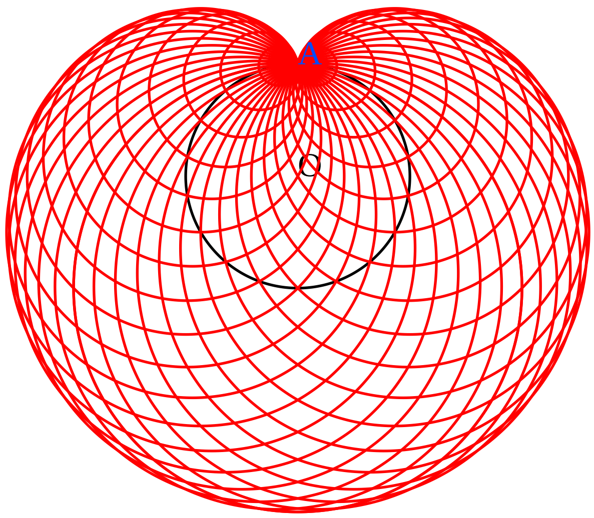
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



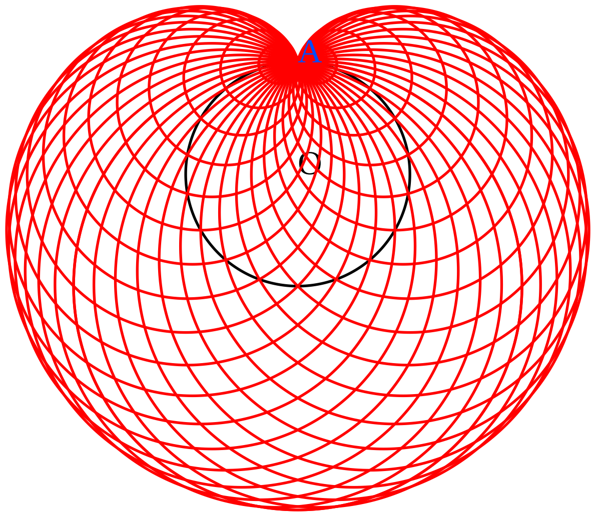
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



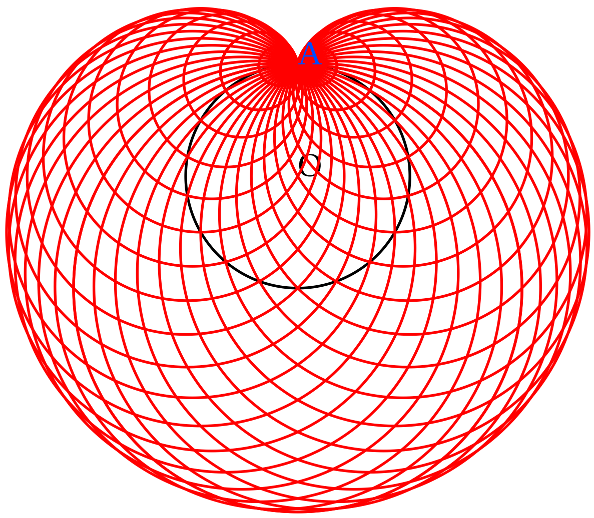
The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.



The cardioid can also be generated as above. Draw a circle O and fix a point A on it. Now draw a set of red circles centered on the circumference of circle O and passing through A. The envelope of a set of red circles is then a cardioid.