Mathematics 308—Diagnostic quiz

Please put your name and all answers on this sheet. Put scratch work on the back. This quiz will be graded, but the grade will not be recorded. Give exact answers when possible, or approximate ones when not, or at least exact formulas when neither seems feasible.

1. A certain small brick has volume $4\ \mathrm{cm}^3$. A second brick has linear dimensions twice that of the first. What is its volume?

2. What is the angle between the vectors $u = [1, 2]$ and $v = [2, 1]$?

3. One angle of a right triangle is 30°. The short side adjacent to this has length 1. What are the other sides?

4. The point $P = (1, 1)$ is rotated around the origin by 30°. What is the new point?

5. A triangle has sides 2, 3, 4. What is its smallest interior angle?

6. The cosine of an acute angle A is 0.4. What is the cosine of $3A$?

7. A spherical globe in the sky has diameter 100 metres and spans a half a degree of arc. How far away is it?

8. The sides of an equilateral triangle are of length 1. What is its area?

9. The sides of an equilateral triangle are of length 1. How far is it from the centre of the triangle to one corner?

10. Sketch the line $3x + 2y = -3$.