

WORKSHOP 2.3

Problem

Let R denote pupil diameter (in mm) and x denote the brightness (in candela per square metre, or cd/m^2) of a light source directed at the pupil. Then

$$R(x) = 7.75 - \frac{8.23x^{0.41}}{2 + 1.43x^{0.41}}.$$

By thinking about our reaction to light, come up with predictions for what the graph of R ought to look like for the pupil diameter model. In particular,

- (a) Should the graph be increasing or decreasing?
- (b) Should the graph be positive or negative?

Next, come up with a plan to test your predictions. This part of the problem should be done without doing any sort of calculations.

After a TA has checked your predictions and your plan, carry out your plan and check your predictions by doing the appropriate calculations.

This model comes from the paper “The effect of field of view size on steady-state pupil diameter” from the journal *Ophthalmic and Physiological Optics*.