

Workshop Module 5

1. You hold two thin, converging lenses. One is thicker in the middle than the other. Which has the longer focal length? Explain.
2. Two mirrors face each other across a square room. An infinite series of reflections can be seen. Why do the images that seem further away also seem dimmer?
3. An object is placed 16.0 cm from a screen.
 - (a) At what two points between object and screen may a converging lens with a 3.50-cm focal length be placed to obtain an image on the screen?
 - (b) What is the magnification of the image for each position of the lens?
4. When a converging lens is immersed in water, does its focal length increase or decrease in comparison with the value in air? Explain and make a drawing showing how the angles of the rays at the interfaces vary in the two cases.
5. There is a large mirror in the new BME building lobby. I am honestly uncertain if it is a standard spherical/parabolic mirror or something funky. Walk over the BME lobby and either as groups or individuals (depending on numbers) try and decide whether this mirror obeys the Mirror Equation. What is its focal length? What kind of images does it produce? What is the magnification? Are these things consistent with the mirror equation. Once each group has a theory, come together to see if you all agree, and if not try and resolve the difference. Can you come up with a way to test any points of disagreement that remain?