

Homework 15

1. The focal length of a thin lens is 0.110 m. You want to use it to produce a real image at 0.600 meters from the lens. How far from the lens should the object be placed?
2. The focal length of a thin lens is -9.00 cm. You place an object 15.0 cm from the lens. (a) Is the image produced real or virtual? (b) What is the image distance (include the correct sign)?
3. You are making a thin lens. The near surface (the surface on the object side) has a radius of curvature of $+5.00$ cm and the far surface has a radius of curvature of $+6.00$ cm. What is the focal length of the lens if the index of refraction of the material is 1.60? What is the focal length if the near and far surfaces are interchanged?
4. A thin lens has a near surface with a radius of curvature of -5.00 cm and a far surface with a radius of curvature of $+7.00$ cm. (a) Is the lens converging or diverging? (b) What is the focal length of the lens if the index of refraction of the material is 1.74? (c) What is the focal length of the other focal point? (d) what would be the focal length if you place the lens in water ($n = 1.33$)?
5. A camera has a lens of focal length 50.0 mm and is focused on an object 0.800 m from the lens. (a) To focus on an object effectively at infinity, will the lens have to move toward or away from the film? (b) How far will the lens have to move? Give the answer in millimeters.