Homework Discussion, Week 9

Physics 1302   Dr. Andersen

Chapter 26

47.) When the glass is filled, Snell's law must apply (taking medium 2 to be the water in the glass)

$$\sin \theta_1 = n_2 \sin \theta_2.$$

From the triangle when the glass has the water in it:

$$\sin \theta_2 = \frac{W/2}{\sqrt{H^2 + (W/2)^2}},$$

and from the triangle when there is no water in the glass

$$\sin \theta_1 = \frac{W}{\sqrt{H^2 + W^2}}.$$

Use those equations to substitute into Snell's law, and solve for W.

51.) a) Use the internal triangle plus Snell's law to determine the angle of incidence at the left face. Set that angle equal to the critical angle, and solve for n.

59.) Draw it.

70.) a) Use the image from the first lens as the object for the second. b) The magnification will be the product of the magnifications due to each individual lens.
Answers: a) 34 cm to the right of the first lens, b) -1.2