

Ch.2 Prob 62

$$h = 3.0 \text{ cm}$$

$$d_o = 5.0 \text{ cm}$$

Diverging lens — $f = -20 \text{ cm}$

Where and how large is The image?

Using The lense formula

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i} \rightarrow \frac{1}{d_i} = \frac{1}{f} - \frac{1}{d_o} = \frac{1}{-20 \text{ cm}} - \frac{1}{5 \text{ cm}}$$

$$\frac{1}{d_i} = \frac{-5}{20} = -0.25 \frac{1}{\text{cm}}$$

$$d_i = -4.0 \text{ cm}$$

Magnification is

$$m = \frac{-d_i}{d_o} = -\frac{(-4.0 \text{ cm})}{5.0 \text{ cm}} = 0.80$$

Size of The image is

$$h_i = m \cdot h_o = (0.80)(3.0 \text{ cm})$$

$$= 2.40 \text{ cm}$$