

$$\begin{aligned}\frac{1}{f} &= \frac{1}{d_o} + \frac{1}{d_i} \\ &= \frac{1}{6.0 \text{ cm}} + \frac{1}{-2.0 \text{ cm}}\end{aligned}$$

$$f = -3.0 \text{ cm}$$

convex mirror

$$\begin{aligned}4. \quad \frac{1}{f} &= \frac{1}{d_o} + \frac{1}{d_i} \\ \frac{1}{d_i} &= \frac{1}{f} - \frac{1}{d_o} \\ &= \frac{1}{5.0 \text{ cm}} - \frac{1}{5.0 \text{ cm}}\end{aligned}$$

$$\begin{aligned}d_i &= \infty \\ \frac{h_i}{h_o} &= -\frac{d_i}{d_o} \\ \frac{h_i}{3.0 \text{ cm}} &= -\frac{\infty}{5.0 \text{ cm}}\end{aligned}$$

$$h_i = \infty$$

$$\begin{aligned}5. \quad \frac{1}{f} &= \frac{1}{d_o} + \frac{1}{d_i} \\ \frac{1}{d_o} &= \frac{1}{f} - \frac{1}{d_i} \\ &= \frac{1}{-5.0 \text{ cm}} - \frac{1}{-3.0 \text{ cm}}\end{aligned}$$

$$d_o = 7.5 \text{ cm}$$

$$\begin{aligned}6. \quad \frac{1}{f} &= \frac{1}{d_o} + \frac{1}{d_i} \\ \frac{1}{d_i} &= \frac{1}{f} - \frac{1}{d_o} \\ &= \frac{1}{-4.0 \text{ cm}} - \frac{1}{8.0 \text{ cm}}\end{aligned}$$

$$d_i = -2.67 \text{ cm}$$

$$\begin{aligned}M &= \frac{d_i}{d_o} \\ &= \frac{-2.67 \text{ cm}}{8.0 \text{ cm}} \\ &= 0.33\end{aligned}$$

$$\begin{aligned}7. \quad M &= \frac{d_i}{d_o} \\ d_i &= d_o M \\ &= (5.0 \text{ cm})(2.5) \\ &= 12.5 \text{ cm}\end{aligned}$$

$$\begin{aligned}\frac{1}{f} &= \frac{1}{d_o} + \frac{1}{d_i} \\ &= \frac{1}{5.0 \text{ cm}} - \frac{1}{12.5 \text{ cm}}\end{aligned}$$

$$f = 8.33 \text{ cm}$$

$$\begin{aligned}\text{Radius} &= 2f \\ &= 2(8.33 \text{ cm}) \\ &= 16.7 \text{ cm}\end{aligned}$$

$$\begin{aligned}8. \quad \frac{h_i}{h_o} &= -\frac{d_i}{d_o} \\ \frac{-6.0 \text{ cm}}{4.0 \text{ cm}} &= -\frac{d_i}{8.0 \text{ cm}}\end{aligned}$$

$$d_i = 12.0 \text{ cm}$$

$$\begin{aligned}\frac{1}{f} &= \frac{1}{d_o} + \frac{1}{d_i} \\ &= \frac{1}{8.0 \text{ cm}} + \frac{1}{12.0 \text{ cm}}\end{aligned}$$

$$f = 4.8 \text{ cm}$$

$$\begin{aligned}9. \quad \frac{h_i}{h_o} &= -\frac{d_i}{d_o} \\ \frac{2.0 \text{ cm}}{3.0 \text{ cm}} &= -\frac{-2.5 \text{ cm}}{d_o}\end{aligned}$$

$$d_o = 3.75 \text{ cm}$$

$$\begin{aligned}\frac{h_i}{h_o} &= -\frac{d_i}{d_o} \\ &= \frac{1}{3.75 \text{ cm}} + \frac{1}{-2.5 \text{ cm}}\end{aligned}$$

$$f = -7.5 \text{ cm}$$

convex