$d_i = 11$ cm

$$M = \frac{d_i}{d_o}$$
$$= \frac{11 \text{ cm}}{11 \text{ cm}}$$
$$= 1.0$$

7. $$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$\frac{1}{d_o} = \frac{1}{f} - \frac{1}{d_i}$$
$$= \frac{1}{6.0 \text{ cm}} - \frac{1}{2.5 \text{ cm}}$$

$d_o = 4.3$ cm

8. $$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$\frac{1}{d_i} = \frac{1}{f} - \frac{1}{d_o}$$
$$= \frac{1}{-4.0 \text{ cm}} - \frac{1}{8.0 \text{ cm}}$$

$d_i = -2.67$ cm

$$M = \frac{d_i}{d_o}$$
$$= \frac{-2.67 \text{ cm}}{8.0 \text{ cm}}$$
$$= 0.33$$

9. $$M = \frac{d_i}{d_o}$$

$$d_i = (M)(d_o)$$
$$= (2)(7.0 \text{ cm})$$
$$= 14 \text{ cm}$$

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$= \frac{1}{7.0 \text{ cm}} + \frac{1}{14 \text{ cm}}$$

$f = 4.7$ cm

10. $$\frac{h_i}{h_o} = -\frac{d_i}{d_o}$$
$$\frac{-6.0 \text{ cm}}{4.0 \text{ cm}} = -\frac{d_i}{9.0 \text{ cm}}$$

$d_i = 13.5$ cm

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$= \frac{1}{9.0 \text{ cm}} + \frac{1}{13.5 \text{ cm}}$$

$f = 5.4$ cm

11. $$\frac{h_i}{h_o} = -\frac{d_i}{d_o}$$
$$\frac{6.0 \text{ cm}}{3.0 \text{ cm}} = -\frac{d_i}{7.0 \text{ cm}}$$

$d_i = -14$ cm

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$= \frac{1}{7.0 \text{ cm}} + \frac{1}{-14 \text{ cm}}$$

$f = 14$ cm

12. $$\frac{h_i}{h_o} = -\frac{d_i}{d_o}$$
$$\frac{2.0 \text{ cm}}{3.0 \text{ cm}} = -\frac{-3.0 \text{ cm}}{d_o}$$

$d_o = 4.5$ cm

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$= \frac{1}{4.5 \text{ cm}} + \frac{1}{-3.0 \text{ cm}}$$

$f = -9.0$ cm

concave

13. $$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$
$$\frac{1}{d_o} = \frac{1}{f} - \frac{1}{d_i}$$
$$= \frac{1}{4.0 \text{ cm}} - \frac{1}{-6.0 \text{ cm}}$$

