

OPHW1-5 Soln)

$o = 16$ cm (presumably positive)

$i = -12$ cm (same side as object)

a)

$$\frac{1}{o} + \frac{1}{i} = \frac{1}{f}$$

$$\frac{1}{f} = \frac{1}{o} + \frac{1}{i} = \frac{1}{16} + \frac{1}{(-12)} = -0.021 \quad \text{so } \mathbf{f = -48 \text{ cm. This is then a diverging lens.}}$$

b)

$$M = -\frac{i}{o} = -\frac{-12}{16} = +0.75.$$

The image is upright.

M is also equal to h_i/h_o , so if $h_o = 0.85$ cm, then $h_i = Mh_o = 0.75 \cdot 0.85 = \mathbf{0.6375 \text{ cm}}$