

OPHW1-5 Soln)

$o = 16$  cm (presumably positive)

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

a)

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

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

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  $h_i = Mh_o = 0.75 \cdot 0.85 = \mathbf{0.6375 \text{ cm}}$