

40. (a) The “object” for the mirror which results in that box-image is equally in front of the mirror (4 cm). This object is actually the first image formed by the system (produced by the first transmission through the lens); in those terms, it corresponds to  $i_1 = 10 - 4 = 6$  cm. Thus, with  $f_1 = 2$  cm, Eq. 35-9 leads to

$$\frac{1}{p_1} + \frac{1}{i_1} = \frac{1}{f_1} \implies p_1 = 3.00 \text{ cm} .$$

- (b) The previously mentioned box-image (4 cm behind the mirror) serves as an “object” (at  $p_3 = 14$  cm) for the return trip of light through the lens ( $f_3 = f_1 = 2$  cm). This time, Eq. 35-9 leads to

$$\frac{1}{p_3} + \frac{1}{i_3} = \frac{1}{f_3} \implies i_3 = 2.33 \text{ cm} .$$