

26. (a) (b) (c) and (d) Our first step is to form the image from the first lens. With $p_1 = 10$ cm and $f_1 = -15$ cm, Eq. 35-9 leads to

$$\frac{1}{p_1} + \frac{1}{i_1} = \frac{1}{f_1} \implies i_1 = -6 \text{ cm} .$$

The corresponding magnification is $m_1 = -i_1/p_1 = 0.6$. This image serves the role of “object” for the second lens, with $p_2 = 12 + 6 = 18$ cm, and $f_2 = 12$ cm. Now, Eq. 35-9 leads to

$$\frac{1}{p_2} + \frac{1}{i_2} = \frac{1}{f_2} \implies i_2 = 36 \text{ cm}$$

with a corresponding magnification of $m_2 = -i_2/p_2 = -2$, resulting in a net magnification of $m = m_1 m_2 = -1.2$. The fact that m is positive means that the orientation of the final image is inverted with respect to the (original) object. The height of the final image is (in absolute value) $(1.2)(1.0 \text{ cm}) = 1.2$ cm. The fact that i_2 is positive means that the final image is real.