

Let:

$$F = 14.0 \text{ cm (focal length)}$$

$$f = 24.0 \text{ cm (object location)}$$

$$h = 2.5 \text{ cm (object size)}$$

$$d = ? \text{ (image position)}$$

$$h' = ? \text{ (image size)}$$

The formula of a spherical mirror:

$$\frac{1}{d} + \frac{1}{f} = \frac{1}{F}$$

$$\frac{1}{d} = \frac{1}{F} - \frac{1}{f}$$

$$\frac{1}{d} = \frac{f-F}{Ff}$$

$$d = \frac{fF}{f-F}$$

Linear magnification

$$\frac{h'}{h} = -\frac{f}{d}$$

$$h' = -\frac{hf}{d}$$

$$d = \frac{24 \cdot 14}{24 - 14} = 33.6 \text{ cm}$$

$$h' = -\frac{2.5 \cdot 24}{33.6} = -1.79 \text{ cm}$$

Answer: image position **33.6** cm from mirror, image size is **1.79** cm.