

Quiz 25.1A

Concave

An object is placed 23.5 cm in front of a ~~convex~~ mirror. The object forms a virtual image that is 1.50 times larger than the object.

- a) What is the focal length of this mirror?
- b) If the object is moved to a point that is twice as far away, 47.0 cm in front of the same mirror, what will be the magnification of the image?

a) Since q^- , p^+ , $M = +1.50 = -\frac{q}{23.5}$

$$\Rightarrow q = -35.25$$

$$\frac{1}{23.5} - \frac{1}{35.25} = \frac{1}{f}$$

$$\Rightarrow \boxed{f = 70.5 \text{ cm}}$$

b) $\frac{1}{47} + \frac{1}{q} = \frac{1}{70.5}$

$$\frac{1}{q} = \frac{1}{70.5} - \frac{1}{47}$$

$$\Rightarrow \boxed{q = -141 \text{ cm}}$$

$$M = -\frac{-141}{47} = \boxed{+3.00}$$