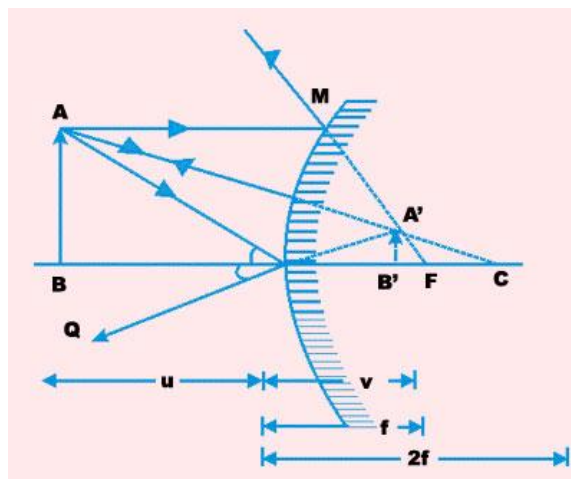


### Answer on Question #41526 – Physics – Other

In an experiment involving a spherical mirror,  $1/v$  was plotted on the vertical axis and  $1/u$  on the horizontal axis. What is the linear magnification?

- a. slope of the graph
- b. inverse of the the slope of the graph
- c. intercept on the vertical axis
- d. intercept on the horizontal axis

**Solution:**



Optical magnification is the ratio between the apparent size of an object (or its size in an image) and its true size, and thus it is a dimensionless number.

If  $v$  is distance from mirror to image and  $u$  is distance from object to mirror, then magnification is equal to:

$$M = \frac{v}{u} = \frac{1}{\frac{1}{v}}$$

$\frac{1}{u}$  was plotted on the horizontal axis and  $\frac{1}{v}$  was plotted on vertical axis, hence linear magnification is the **inverse of the the slope of the graph**

$$\left( \text{inverse slope of the graph} = \frac{1}{\frac{\text{vertical axis}}{\text{horizontal axis}}} = \frac{\text{horizontal axis}}{\text{vertical axis}} = \frac{1}{\frac{1}{v}} = M \right)$$

**Answer:** b. inverse of the the slope of the graph.