

Chapter 10

REFLECTION AND REFRACTION

Example- 9:

A diverging lens or a concave lens of focal length, $f = 15$ cm forms an image 10 cm from the lens. Draw a ray diagram and prove that the object is placed 30 cm away from the lens. Use a scale of 1 : 5.

Solution:

In figure, A'B' is the image AB is the real object. Also by measurements.

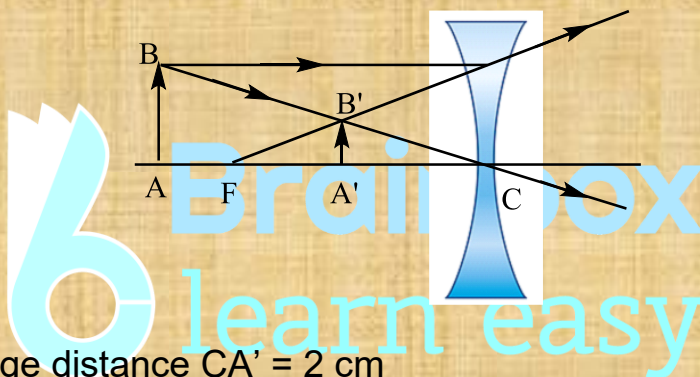


Image distance $CA' = 2$ cm

i.e., $v = 10$ cm

Focal length, $CF = 3$ cm i.e., $f = 15$ cm

$$\text{As } \frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$\text{Or } \frac{1}{u} - \frac{1}{v} = \frac{1}{f} = \frac{1}{10} - \frac{1}{15} = \frac{3-2}{30} = \frac{1}{30}$$

Or $u = 30$ cm CA comes to be 6 cm.

Hence, object distance = 30 cm.