

611.

Problem 44.11 (RHK)

An object is 20 cm to the left of a thin diverging lens having a focal length of -30 cm. We have to find where the image is formed.

Solution:

The thin lens equation is

$$\frac{1}{o} + \frac{1}{i} = \frac{1}{f},$$

where o is the object distance, i is the image distance and f is the focal length.

$$o = 20 \text{ cm},$$

$$f = -30 \text{ cm}.$$

Therefore,

$$\frac{1}{i} = \left(-\frac{1}{30} - \frac{1}{20} \right) \text{ cm}^{-1},$$

and

$$i = -12 \text{ cm}.$$

As the image distance is negative, in the sign convention it is in the V-side of the lens, and therefore is to the left of the lens.

