

Answer on Question #75516, Physics / Optics

An object is placed 60 cm from a screen. Where should you place a convex lens of focal length 15 cm to get the image of the object on the screen?

Answer:

Let : F – focal length, f – distance from image to lens, d – distance from object to lens

According to thin lens formula:

$$\frac{1}{F} = \frac{1}{f} + \frac{1}{d} = \frac{1}{0.15}$$

Also, in our case, distance from object to screen is fixed: $f + d = 0.6$

$$\text{So, we have: } \begin{cases} -\frac{1}{15} = \frac{1}{f} + \frac{1}{d} \\ f + d = 0.6 \end{cases}$$

From this, we find f, d :

$$\begin{aligned} f &= 0.3m \\ d &= 0.3m \end{aligned}$$

So, you have to place a lens exactly in the middle.

Answer provided by <https://www.AssignmentExpert.com>