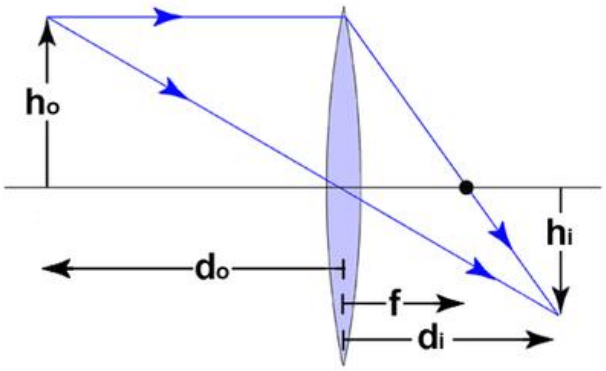
Answer on Question#39498, Physics, Optics

The power of a convex lens is 5D. At what distance object should be placed from the lens so that, 2 times larger image is formed.

Solution:



The linear magnification of a thin lens is

$$M = \frac{f}{f - d_o} = \frac{h_i}{h_o} = 2$$

where f is the focal length and d_o is the distance from the lens to the object.

$$d_o = \frac{f(M-1)}{M}$$

The power of a lens is 1/focal length (measured in meters):

$$P = \frac{1}{f} = 5 \text{ D}$$

Thus,

$$f = \frac{1}{D} = \frac{1}{5} = 0.2 \text{ m}$$

$$d_o = \frac{f(M-1)}{M} = \frac{0.2(2-1)}{2} = 0.1 \text{ m}$$

Answer. 0.1 m.