

hhh.38.20_38.21

38.20 If the image is erect it must be a virtual image.

This can happen with a concave lens

or a convex lens if the object is held inside the focal length

But the object distance is 200 cm

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$

Since the object is virtual d_i is negative, so we get

$$\frac{1}{f} = \frac{1}{200} + \frac{1}{-10}$$

On your calculator there is a key marked x^{-1} . It is very handy for these calculations.

Thus $f =$ _____

38.21 Since $M = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$

And we know the image appears on a screen so it must be real and inverted. So d_i is a positive number

Using $\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$

and the fact that $d_i = 24d_o$ solve for f

But the problem is made a little harder by the fact that $d_i + d_o = 12.5m$

(the lens is placed somewhere between the illuminated object and the wall)

So you have three equations in three unknowns . Solve.