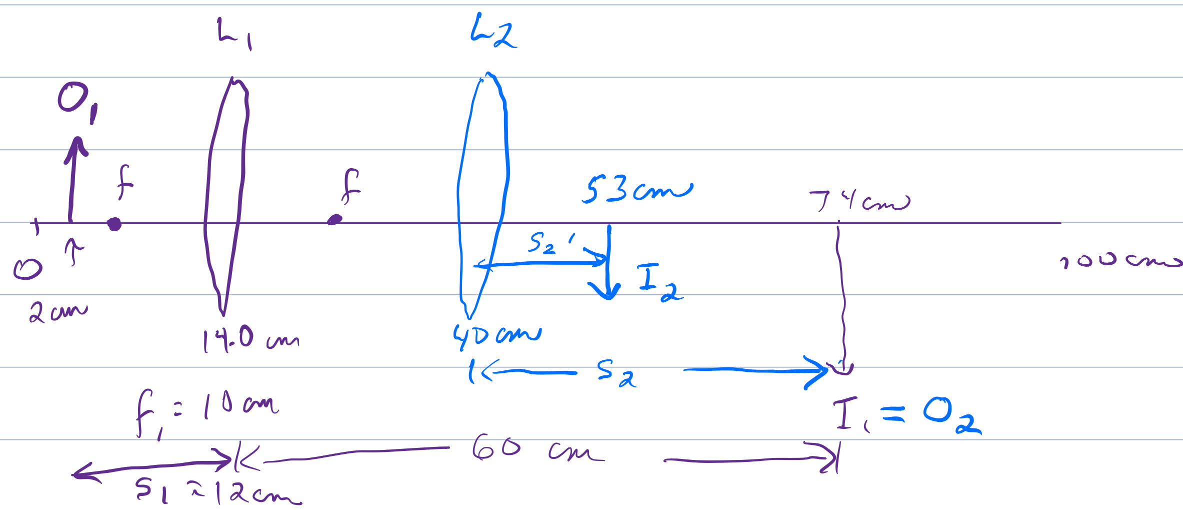
$$\frac{1}{f} = \frac{1}{s'} + \frac{1}{s}$$

f ↑ focal length of lens

s' ↑ distance from lens to image

s ← distance from lens to ~~image~~ object



$$\frac{1}{f_1} = \frac{1}{s_1} + \frac{1}{s_1'} \Rightarrow \frac{1}{s_1'} = \frac{1}{f_1} - \frac{1}{s_1} = \frac{1}{10\,cm} - \frac{1}{12\,cm}$$

$s_1' = 60$ cm.

Add a second lens L_2, $f_2 = ?$

Put it at 40 cm on the bench.

Observe final image is at 53 cm on the bench. what is f_2 ?

$$\frac{1}{f_2} = \frac{1}{s_2} + \frac{1}{s_2'}$$

$s_2 = -34$ cm

$s_2' = 13$ cm

$$\frac{1}{f_2} = \frac{1}{-34\,cm} + \frac{1}{13\,cm} \Rightarrow f_2 = 21\,cm$$

~~Thin~~ Two slits $d \sin\theta = m\lambda$

tiny d (diffraction grating) $\Rightarrow$ big θ

Typical two slit $\Rightarrow$ $d =$ ~~sm~~ big, θ is small

Finite slits 2 under water

$$d \sin\theta = m\lambda = m\left(\frac{\lambda_v}{n}\right)$$

$\downarrow$ $\downarrow$ $\uparrow$ index of refraction.