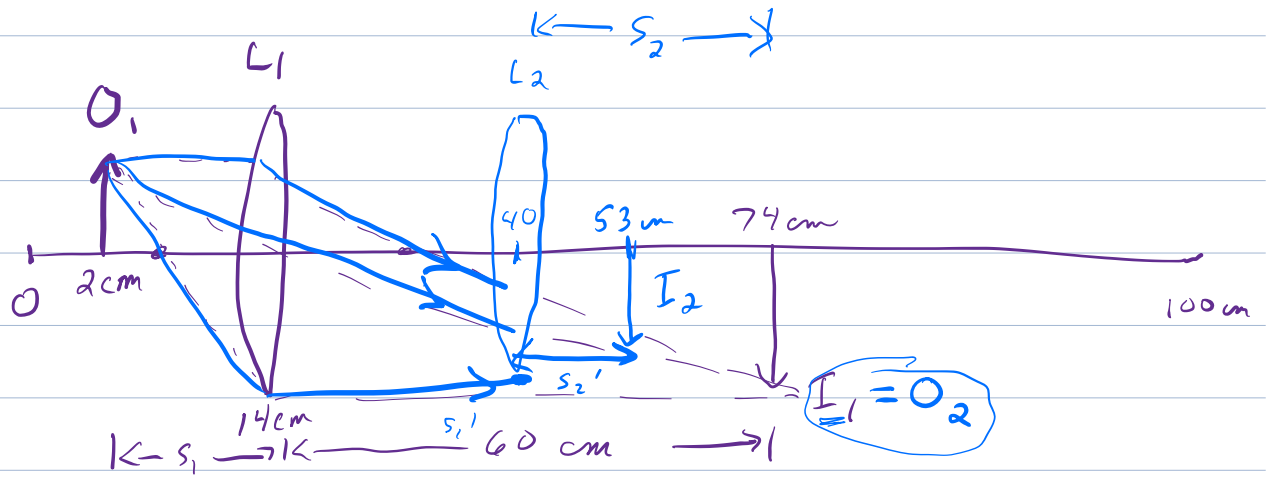
$$\frac{1}{f} = \frac{1}{s} + \frac{1}{s'}$$

f: focal length

s: distance from object to lens

s': distance from lens to image.



$f_1 = 10\text{cm}$ (given)

where is image 1 ?

$$\frac{1}{f_1} = \frac{1}{s_1} + \frac{1}{s_1'} \qquad s_1 = 12\text{cm}$$

$$\frac{1}{s_1'} = \frac{1}{f_1} - \frac{1}{s_1} = \frac{1}{10\text{cm}} - \frac{1}{12\text{cm}} \Rightarrow s_1' = 60\text{cm}$$

Next: Add Lens 2 at 40 cm on bench.

Observe New image 2 @ 53 cm on bench

what is f_2?

$$\frac{1}{f_2} = \frac{1}{s_2} + \frac{1}{s_2'} \qquad s_2 = -34\text{ cm} \qquad s_2' = 13\text{ cm}$$

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

$$m_1 = \frac{-s_1'}{s_1} = \frac{-60\text{ cm}}{12\text{ cm}} = -5$$

$$m_2 = \frac{-s_2'}{s_2} = \frac{-13\text{ cm}}{-34} = +0.38$$

16.48 See pg. 570 Eq. 16.12, Fig 16.33

Combine f_1 and f_2, get

$f_{osc} = \frac{1}{2}(f_1 + f_2)$ (HW: 5 peaks in 0.1 s, 50 peaks in 1.0 s → 50 Hz)

$f_{beats} = |f_1 - f_2| = 2\text{ Hz}$

$f_1, f_2 = 49, 51\text{ Hz}$

Ch 15: Mostly jargon

λ, f, T, ω, A

v set by physics of what's waving

$v = \lambda f$

Power + Intensity Units

Doppler shift

Interference

Compare Δn to λ

Small angles ?

$d \sin\theta = m\lambda$

↓ ↑

↑ ↓

diffraction grating

two slits