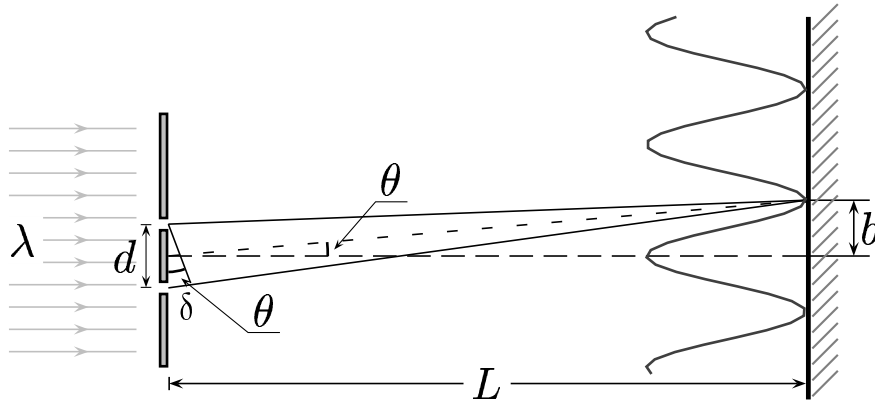


Consider the double slit experiment setup with two incident waves.

A:  $\lambda_A = 400$  nm, and 1st minimum occurs at  $y = b_A$ .

B:  $\lambda_B = 600$  nm, and 1st minimum occurs at  $y = b_B$ .



In the small angle approximation, determine the ratio  $\frac{b_B}{b_A}$ .

- A)  $\frac{b_B}{b_A} = 1.5$ .
- B)  $\frac{b_B}{b_A} = 1$ .
- C)  $\frac{b_B}{b_A} = .67$ .

The first minimum occurs at phase angle difference:

$$\phi = k \delta = \pi.$$

Therefore,  $\delta = \frac{\lambda}{2}$ .

$$\theta \approx \frac{\delta}{d} \approx \frac{b}{L}.$$

With  $\delta = \frac{\lambda}{2}$ ,

$$b = \frac{\delta L}{d} = \frac{\lambda L}{2d}.$$

So  $\frac{b_B}{b_A} = \frac{\lambda_B}{\lambda_A} = \frac{600}{400} = 1.5$ .

Answer **A**.