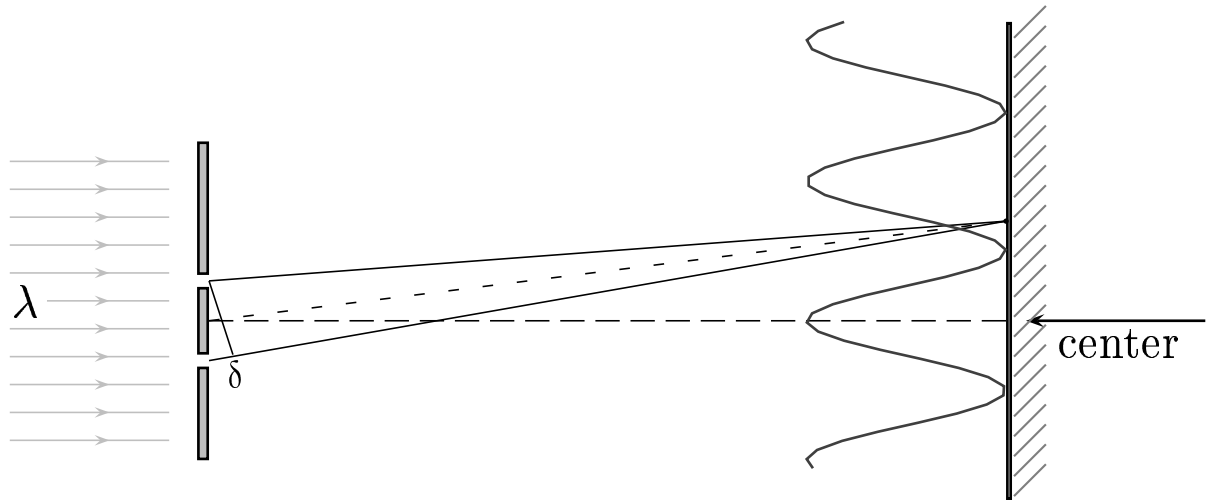


Consider the setup of a double slit experiment. Denote the intensity at the center of the screen to be  $I_0$ .



Find the corresponding intensity  $I$  for a path difference  $\delta = \frac{\lambda}{6}$ .

A)  $I = \frac{I_0}{4}$ .

B)  $I = \frac{I_0}{2}$ .

C)  $I = \frac{3I_0}{4}$ .

$$I = I_0 \cos^2 \left( \frac{\phi}{2} \right)$$

$$\phi = k \delta$$

$$k = \frac{2\pi}{\lambda}$$

Therefore the phase difference is

$$\phi = \frac{2\pi}{\lambda} \frac{\lambda}{6} = \frac{\pi}{3}.$$

And  $I = I_0 \cos^2 \left( \frac{\pi}{6} \right) = \frac{3 I_0}{4}.$

Answer **C**.

37.03-03 Double Slits From Delta I 2006-9-14