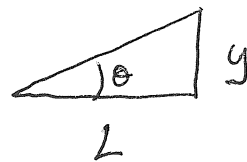


Coherent light from a sodium-vapor lamp is passed through a filter that blocks everything except light of a single wavelength. It then falls on two slits separated by 0.460mm . In the resulting interference pattern on a screen 2.20m away adjacent bright fringes are separated by 2.82mm . What is the wavelength?

$$d \sin \theta = m \lambda$$



$$d = 0.460 \times 10^{-3} \text{m}$$

$$\tan \theta = \frac{y}{L}$$

$$\theta = \tan^{-1} \left(\frac{y}{L} \right)$$

$$\lambda = d \sin \left[\tan^{-1} \left(\frac{2.82 \times 10^{-3} \text{m}}{2.20 \text{m}} \right) \right]$$

$$= 589.6 \text{ nm}$$

$$\boxed{590 \text{ nm}}$$