3. At most, how many bright fringes can be formed on either side of the central bright fringe when light of wavelength 625 nm falls on a double slit whose slit separation is 3.76×10^{-6} m?

Bright Fringes in a double-slit experiment have the defining equation

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

Solve for m

$$m = \frac{d \sin(\theta)}{\lambda}$$

The largest number m, would happen at largest angle which would be 90°

$$m = \frac{d \sin(\theta)}{\lambda} = \frac{d \sin(90°)}{\lambda} = \frac{d}{\lambda} = \frac{3.76 \; x \; 10^{-6} \; m}{625 \; x \; 10^{-9} \; m} = 6.02$$

Fringes must be integers so

$$\boxed{m = 6}$$

Please send any comments or questions about this page to ddonovan@nmu.edu
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