

P #31

Ch 24 - pg 776

$$\begin{aligned} a) \quad \lambda &= 587.5 \text{ nm} = 587.5 \times 10^{-9} \text{ m} \\ d &= .75 \text{ mm} = 7.5 \times 10^{-4} \text{ m} \end{aligned}$$

$$x_1(\text{min}) = .85 \text{ mm} = 8.5 \times 10^{-4} \text{ m}$$

For a single slit: $x_m \approx \frac{m \cdot \lambda \cdot L}{d}$ describes destructive interference

$$(8.5 \times 10^{-4} \text{ m}) \approx \frac{1(L) \cdot (587.5 \times 10^{-9} \text{ m})}{(7.5 \times 10^{-4} \text{ m})}$$

$$L = 1.085 \text{ m}$$

$$b) \quad W = 2 \cdot x_1(\text{min}) \quad (\text{See Question \#30})$$

$$W = 2(.85 \text{ mm})$$

$$W = 1.7 \text{ mm}$$