

class 20 ch 35 & 36

35-33 $900 \times 633 \text{ nm} = 570 \mu\text{m} = .57 \text{ mm}$

36-9 $\lambda = \frac{344}{1250} = .275 \text{ m}$

mins: $\frac{\lambda}{2} = \frac{a}{2} \sin \theta \Rightarrow \sin \theta = \frac{\lambda}{a} = \frac{.275}{1} = 16^\circ$
 $2 \times \quad \quad \quad 33^\circ$
 $3 \times \quad \quad \quad 55.6^\circ$

36-14 $\lambda = 620 \text{ nm}$
 $a = .450 \text{ mm}$
 $R = 3 \text{ m}$

$\sin \theta \approx \tan \theta \approx \frac{y}{R} \quad \frac{\beta}{2} = \frac{\pi a \sin \theta}{\lambda} \approx \frac{\pi a y}{\lambda R}$

$\frac{I}{I_0} = \left(\frac{\sin(\beta/2)}{\beta/2} \right)^2$

$y = 1 \text{ mm} \rightarrow \frac{\beta}{2} = .76 \rightarrow \frac{I}{I_0} = .82$

$y = 3 \text{ mm} \rightarrow \frac{\beta}{2} = 2.28 \rightarrow \begin{matrix} .11 \leftarrow \text{min in here} \\ .026 \end{matrix}$

$y = 5 \text{ mm} \rightarrow \quad \quad 3.8 \rightarrow$

Remark: the first min is $\lambda = a \sin \theta = a \frac{y}{R} \rightarrow y = 4.13 \text{ mm}$