

14. (a) For the maximum adjacent to the central one, we set $m = 1$ in Eq. 36-14 and obtain

$$\theta_1 = \sin^{-1} \left(\frac{m\lambda}{d} \right) \Big|_{m=1} = \sin^{-1} \left[\frac{(1)(\lambda)}{100\lambda} \right] = 0.010 \text{ rad} .$$

- (b) Since $y_1 = D \tan \theta_1$ (see Fig. 36-8(a)), we obtain $y_1 = (500 \text{ mm}) \tan(0.010 \text{ rad}) = 5.0 \text{ mm}$. The separation is $\Delta y = y_1 - y_0 = y_1 - 0 = 5.0 \text{ mm}$.