

14. (a) For the maximum adjacent to the central one, we set  $m = 1$  in Eq. 35-14 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. 35-10(a)), we obtain

$$y_1 = (500 \text{ mm}) \tan (0.010 \text{ rad}) = 5.0 \text{ mm.}$$

The separation is  $\Delta y = y_1 - y_0 = y_1 - 0 = 5.0 \text{ mm.}$