

85. Using Eq. 36-16 with the small-angle approximation (illustrated in Sample Problem 36-2), we arrive at

$$y = \frac{(m + \frac{1}{2}) \lambda D}{d}$$

for the position of the $(m + 1)^{\text{th}}$ dark band (a simple way to get this is by averaging the expressions in Eq. 36-17 and Eq. 36-18). Thus, with $m = 1$, $y = 0.012$ m and $d = 800\lambda$, we find $D = 6.4$ m.