36.13

Datos

$\lambda = 580 \cdot 10^{-9}\ m$

$\theta_1 = 90°$

$\theta_2 = 45°$

a) Se puede utilizar: $a \operatorname{sen}\theta = m\lambda$

$$a = \frac{m\lambda}{\operatorname{sen}\theta_1} = \frac{(1)(580 \cdot 10^{-9})}{\operatorname{sen}\left(\frac{\pi}{2}\right)} = \frac{580 \cdot 10^{-9}\ m}{(1)}$$

$$a = 580 \cdot 10^{-9}\ m$$

b) La ecuación para calcular intensidad en una rendija es:

$$I = I_0 \left\{ \frac{\operatorname{sen}\left[\pi a (\operatorname{sen}\theta_2)/\lambda\right]}{\pi a (\operatorname{sen}\theta_2)/\lambda} \right\}^2$$

sustituir $a = \lambda$; debido al inciso a y $\theta_2 = \frac{\pi}{4}$ por datos.

$$\frac{I}{I_0} = \left\{ \frac{\operatorname{sen}\left[\pi\lambda \left(\operatorname{sen}\frac{\pi}{4}\right)/\lambda\right]}{\pi\lambda \left(\operatorname{sen}\frac{\pi}{4}\right)/\lambda} \right\}^2 = \left\{ \frac{\operatorname{sen}\left[\pi \operatorname{sen}\left(\frac{\pi}{4}\right)\right]}{\pi \operatorname{sen}\frac{\pi}{4}} \right\}^2$$

$$\frac{I}{I_0} = 0.126.$$