

EJERCICIO 3.

a) $E_1 = E_2 e^{j \frac{2\pi d}{\lambda}}$

b) $E = E_1 + E_2 e$

$$|E|^2 = E_1^2 \left(1 + \cos \frac{2\pi d}{\lambda}\right)^2 + E_1^2 \left(\sin \frac{2\pi d}{\lambda}\right)^2 =$$

$$= I_1 \left(1 + 2 \cos \frac{2\pi d}{\lambda} + 1\right) = 2I_1 \left(1 + \cos \frac{2\pi d}{\lambda}\right) = I_1$$

$$\Rightarrow 1 + \cos \frac{2\pi d}{\lambda} = \frac{1}{2} ; \cos \frac{2\pi d}{\lambda} = -\frac{1}{2} ; \frac{2\pi d}{\lambda} = \frac{\pi}{3}$$

$$d = \frac{\lambda}{6}$$

c) $E = E_1 + \frac{E_1}{2} e^{j \frac{\pi}{3}} \Rightarrow |E|^2 = I_1 \left[\left(1 + \frac{1}{2} \cos \frac{\pi}{3}\right)^2 + \left(\frac{1}{2} \sin \frac{\pi}{3}\right)^2 \right] =$

$$= I_1 \left[1 + \frac{1}{4} + 2 \cos \frac{\pi}{3} \right] = \frac{I_1}{4}$$