

P63

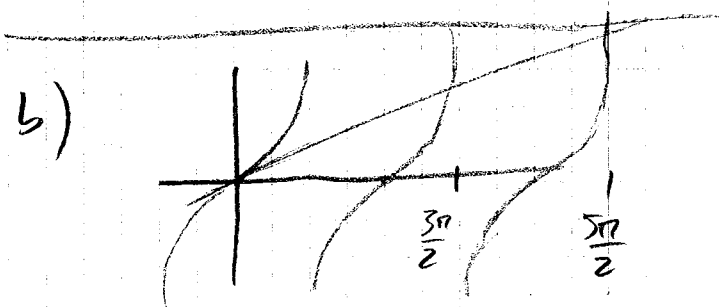
6-30

$$I = I_m \left( \frac{\sin \alpha}{\alpha} \right)^2$$

$$a) \quad \frac{\partial I}{\partial \alpha} = \frac{\alpha^2 \sin \alpha \cos \alpha - 2\alpha \sin^2 \alpha}{\alpha^4} = 0$$

$$\Rightarrow \alpha \cos \alpha = \sin \alpha$$

$$\Rightarrow \alpha = \tan \alpha$$



$\alpha$  skall vara  
strax under

$$\frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}, \frac{9\pi}{2}$$

Lös t.ex. genom att rita graf  
eller genom iteration, t.ex.

$$\alpha_1 = \frac{5\pi}{2} = 7,854$$

$$\alpha_2 = \arctan 7,854 = 1,444$$

$$\alpha_3 = 1,444 + 2\pi = 7,727$$

$$\alpha_4 = \arctan 7,727 = 1,442$$

$$\alpha_5 = 1,442 + 2\pi = 7,725$$

$$\alpha_6 = \arctan 7,725 = 1,442 \quad \underline{\underline{ok}}$$

$$\Rightarrow \underline{\underline{\alpha = 7,725}}$$

osv för de andra  $4,493, 7,725, 10,904, \dots$

$$c) \quad a \sin \theta = m\lambda \Rightarrow m = \frac{a \sin \theta}{\lambda} = \frac{\alpha}{\pi}$$

$$\text{Här är } m = \frac{\alpha}{\pi} = \frac{4,493}{\pi} = 1,430$$

$2,459 ; 3,471, \dots$