

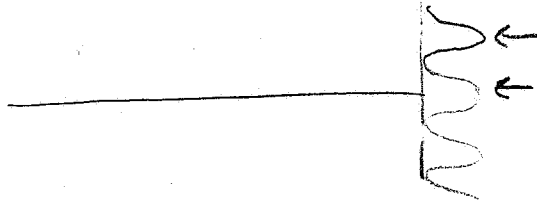
QUIZ 5  
 Spring 2005  
 3:30 Section Thursday Quiz  
 8:30 recitation  
 Frank De Lucia

In a double-slit arrangement the slits are separated by a distance equal to 100 times the wavelength of the light passing through the slits.

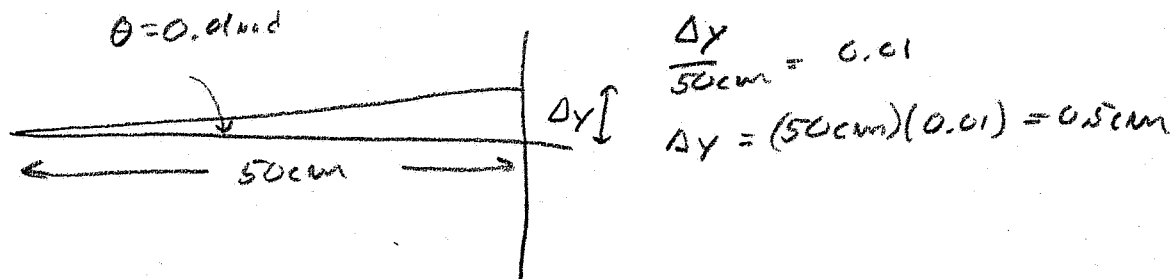
- (a) What is the angular separation in radians between the central maximum and an adjacent maximum?

$$d \sin \theta = m \lambda, \quad m=1$$

$$\sin \theta = \theta = \frac{1}{100} = 0.01 \text{ rad}$$



- (b) What is the distance between these maxima on a screen 50.0 cm from the slits?



- (c) What is the angular separation in radians between the first minimum on each side of the central maximum?

$$d \sin \theta = (m + \frac{1}{2}) \lambda, \quad m=0$$

$$\sin \theta = \frac{1}{2} \frac{\lambda}{d} = 0.005 \text{ rad}$$

this is angle to  $\textcircled{1}$

$$\Delta \theta_{\text{total}} = 2 \times 0.005 \text{ rad} = 0.01 \text{ rad}$$

