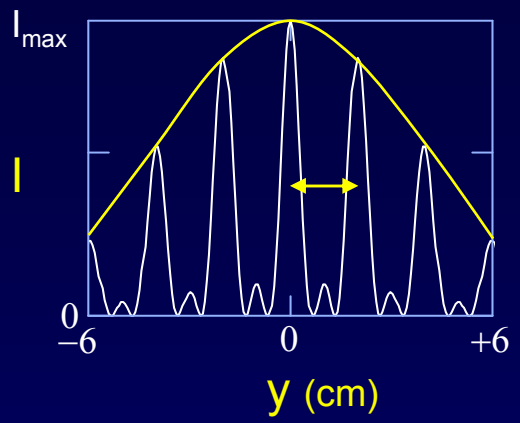
Solution

Light of wavelength λ is incident on an N-slit system with slit width a and slit spacing d.

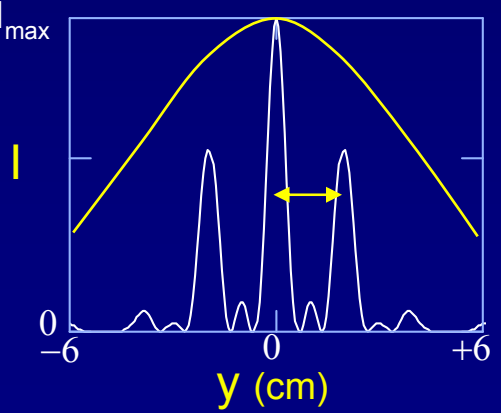


1. The intensity I as a function of y at a viewing screen located a distance L from the slits is shown to the right. L >> d, y, a. What is N?

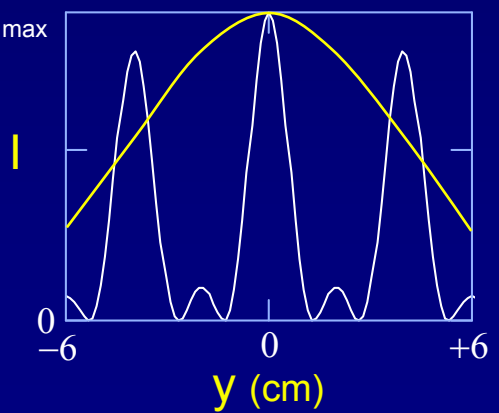
a) N = 2 **b) N = 3** c) N = 4

N is determined from the number of minima between two principal maxima.
$N = \#_{minima} + 1$ Therefore, N = 3 .

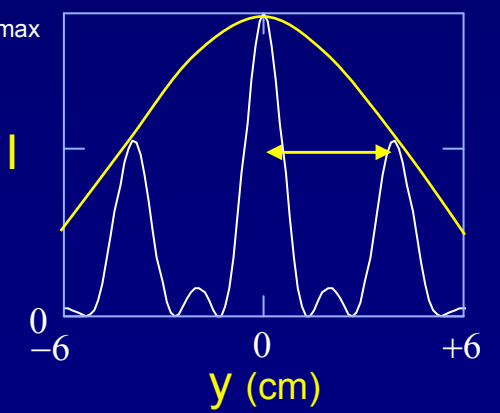
2. Now the slit spacing d is halved, but the slit width a is kept constant. Which of the graphs best represents the new intensity distribution?

a) 

Interference spacing should change.

b) 

Diffraction profile shouldn't change.

c) 

Interference spacing doubles. Diffraction profile is unchanged.