

**HOMEWORK ASSIGNMENT FOR JULY 26, 2005**

Consider the interference between two slits separated by a distance  $d$  on which light of wavelength  $\lambda$  shines, producing a pattern of dark and bright fringes on a screen a distance  $D$  away from the slits.

First draw a sketch of this physical situation, showing light shining on two slits and passing through them to the screen beyond it.

Then calculate and enter in the tables below the first three angles at which interference maxima (bright fringes) and interference minima (dark fringes) occur for red (700 nm) and violet (400 nm) light for the different separations shown, and the positions of these bright and dark fringes (relative to the central maximum) on the screen.

*Separation  $d = 10.0 \mu\text{m}$*

	Angle	Position when $D = 1.0 \text{ m}$	Position when $D = 2.0 \text{ m}$
<b>RED LIGHT</b>			
First minimum			
First maximum			
Second minimum			
Second maximum			
Third minimum			
Third maximum			
<b>VIOLET LIGHT</b>			
First minimum			
First maximum			
Second minimum			
Second maximum			
Third minimum			
Third maximum			

Separation  $d = 20.0 \mu\text{m}$

	Angle	Position when $D = 1.0 \text{ m}$	Position when $D = 2.0 \text{ m}$
<b>RED LIGHT</b>			
First minimum			
First maximum			
Second minimum			
Second maximum			
Third minimum			
Third maximum			
<b>VIOLET LIGHT</b>			
First minimum			
First maximum			
Second minimum			
Second maximum			
Third minimum			
Third maximum			

Now look at the results and summarize how the following affect the pattern (making the fringes farther apart or closer, or whatever):

increasing the wavelength of the incident light:

increasing the separation of the slits:

increasing the distance to the screen: