1. The pattern of bright and dark spots shown below is due to a red laser shining on two slits. I have made it darker on the page where the light is brighter on the screen.

(a) Sketch a graph of intensity as a function of position for the pattern you have shown above. Match the horizontal scales.

(c) **Label** the center bright spot with a zero, it is the zeroth order maximum.

(d) What is the path difference for this maximum?  

(e) **Number** the rest of your maxima with the appropriate value of m (the integer number of wavelengths of path difference).

(f) What is the path difference for the minimum located between the 2nd and 3rd maxima?  

(g) If the slit width is 0.025 mm, what is the separation of the slits?

(h1) If the distance between the slits is halved, the bright and dark spots on the screen will be

- half as far apart
- the same distance apart
- twice as far apart
- closer together but not half
- farther apart but not twice as far  
(Circle one.)

(h2) If the laser light is changed to green, the new wavelength is  

- smaller than
- the same as
- longer than
- the original red wavelength.  
(Circle one.)

(h3) If the laser light is changed to green, the bright and dark spots on the screen will be

- half as far apart
- the same distance apart
- twice as far apart
- closer together but not half
- farther apart but not twice as far  
(Circle one.)

(i) If the whole apparatus is submerged in cooking sherry (without causing any damage to the laser!), the bright and dark spots on the screen will be

- half as far apart
- the same distance apart
- twice as far apart
- closer together but not half
- farther apart but not twice as far  
(Circle one.)
2. When light from a green laser shines on slits A, it produces the pattern shown. When light from the same green laser shines on slits B, it produces the different pattern shown. Note: the lines mark the centers of the bright fringes.

(1) Is the slit width \( a \) from A (Circle one.) greater than, less than, equal to the slit width from B?

(2) Is the slit separation \( d \) from A (Circle one.) greater than, less than, equal to the slit separation from B?

(3) Is the ratio of \( \frac{d}{a} \) for A (Circle one.) greater than, less than, equal to the ratio from B?