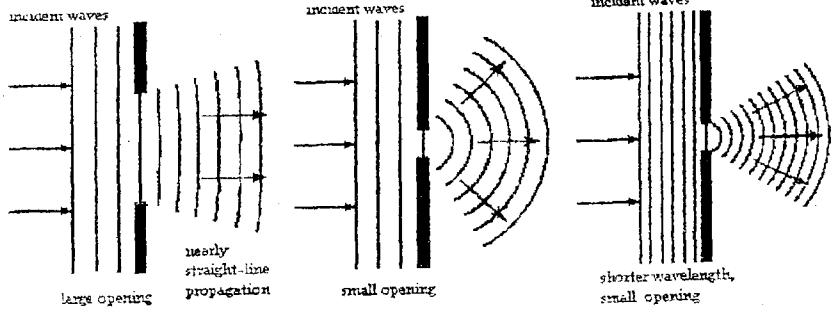
SPH4U

Mock Light Test

1. State 3 differences between Newton's particle model of light and Huygen's wave model. /3

2. How does the width of the maxima produced by a diffraction grating compare to those produced by a double slit? /2

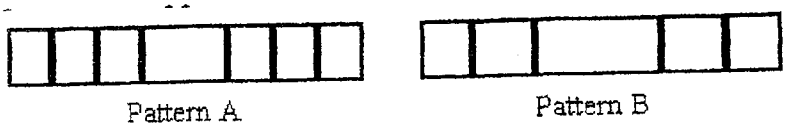
3. Consider the diagrams below which represent diffraction of water waves under various circumstances.



What conclusions concerning the amount of diffraction compared to the wavelength and size of the opening can be made from these diagrams? /2

4. Explain how polarizing sunglasses reduce the glare off the smooth surface of water. /2

5. A student creates single-slit interference as shown in pattern A, below. What physical changes to the experimental apparatus could be made to create interference pattern B? /3



Pattern A

Pattern B

6. In a two-point interference pattern, a certain nodal point is located 25.0 m from one source and 17.5 m from another. If the wavelength is 5.0 m, on what nodal line is the point located? /3

7. A double-slit experiment is performed using a slit separation of 0.12 mm with a screen placed 80.0 cm away. There are 18 mm between the first and seventh maxima. What wavelength of light was used? /3

8. A double-slit interference pattern using blue light with a wavelength of 438 nm creates a pattern with first-order minima that are 6.50 cm apart. If the slit spacing used is 17.5 μm, how far away is the screen? /3

9. Blue (λ = 450 nm) and red light (λ = 600 nm) are passed through a diffraction grating with 5000 slits/cm. What is the spacing between the second-order bright blue and red fringes, if the screen is 2.0 m from the grating? /4