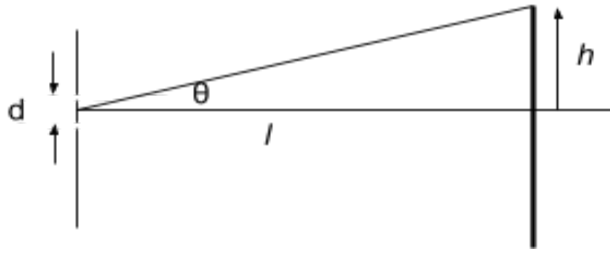


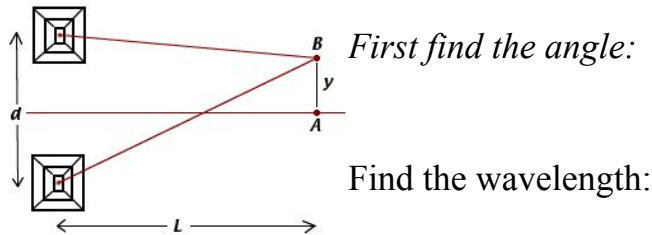
Double Slit Diffraction Problems Young's Double Slit Formula: $m\lambda = d \sin(\theta)$



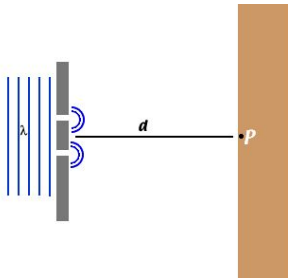
1) In a double slit interference experiment, the distance between the slits is 0.0005m and the screen is 2 meters from the slits. Yellow light from a sodium lamp is used and it has a wavelength of 5.89×10^{-7} m. Show that the distance between the first and second fringes on the screen is 0.00233 m. (Fringe is another word for bright spot).

2) With two slits spaced 0.2mm apart, and a screen at a distance of $D = 1$ m, the third bright fringe is found to be displaced $s = 7.5$ mm from the central fringe. Show that the wavelength, λ , of the light used is 5×10^{-7} m .

3. Two radio towers are broadcasting on the same frequency. The signal is strong at A, and B is the first signal minimum. If $d = 6.8$ km, $D = 11.2$ km, and $s = 1.73$ km, what is the wavelength of the radio waves to the nearest meter?



4a. Water waves of wavelength of 5.44 meters are incident upon a breakwater with two narrow openings separated by a distance 247 meters. To the nearest thousandth of a degree what is angle corresponding to the first wave fringe maximum?



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5. In a double-slit experiment it is found that blue light of wavelength 467 nm gives a second-order maximum at a certain location on the screen. What wavelength of visible light would have a minimum at the same location?

Two different experiments with the same slit spacing, d , and same angle, θ .

6. Find the distance between adjacent dark spots from a double slit diffraction pattern if the wavelength of light is 500 nm, the distance between the slits is 1 mm, and the distance from the slit to the screen is 2 m.

Since spots are almost uniformly spaced, the distance between dark spots is the same as the distance between bright spots. So just find distance to first bright spot.

-First find the angle:

-Now use that angle to find the height of the first bright spot