## WAVE OPTICS: DOUBLE SLIT WS 4

1. At what angle is the first-order maximum for $450-\mathrm{nm}$ wavelength blue light falling on double slits separated by 0.0500 mm ?
2. What is the separation between two slits for which $610-\mathrm{nm}$ orange light has its first maximum at an angle of $30.0^{\circ}$ ?
3. In a double slit experiment with monochromatic light, the separation between the slits is 2 mm . If the screen is moved by 100 mm toward the slits, the distance between the central bright line and the second bright line changes by $32 \mu \mathrm{~m}$. Calculate the wavelength of the light used for the experiment.
4. In a Young's double-slit experiment, the slit separation is doubled. To maintain the same fringe spacing on the screen, what must be the screen-to-slit distance $D$ ?
5. In Young's double slit experiment, the second order bright band of one light source overlaps the third order band of another light source. If the first light source has a wavelength of 660 nm , what is the wavelength of the second light source?
6. If one of the two slits in a Young's double-slit demonstration of the interference of light is covered with a thin filter that transmits only half the light intensity, describe what will occur.
7. A double slit is located a distance $x$ from a screen as shown. Calculate the distance between fringes for $633-\mathrm{nm}$ light falling on double slits separated by 0.0800 mm , located 3.00 m from a screen.
8. Using the result of the above problem, find the wavelength of light that produces fringes 7.50 mm apart on a screen 2.00 m from double slits separated by 0.120 mm .
