Graphing Calculator *Practice*

Double-Slit Experiment

One of the classic experiments that demonstrate the wave nature of light is the double-slit experiment. In this experiment, light from a single source is passed through a narrow slit and then through two narrow parallel slits. When the light appears on a viewing screen behind the slits, you see a pattern of alternating bright and dark fringes corresponding to constructive and destructive interference of the light.

As you studied earlier in the chapter, the bright fringes are described by the following equation.

$$d\sin\theta = \pm\, m\lambda$$

In this equation, d is the slit separation, θ is the fringe angle, m is the order number, and λ is the wavelength of the incident wave. Typically, only the first few fringes ($m = 0, 1, 2, 3$) are bright enough to see.

In this graphing calculator activity, you will calculate a table of fringe angles. By analyzing this table, you will gain a better understanding of the relationship between fringe angles, wavelength, and slit separation.

Visit go.hrw.com and enter the keyword **HF6INFX** to find this graphing calculator activity. Refer to **Appendix B** for instructions on downloading the program for this activity.