Name: _____

Physics 202 Quiz 8

Jun 5, 2013

Word Problems

Show all your work and circle your final answer. (Ten points each.)

1. A flat screen is located 0.60 meters away from a single slit. Light with a wavelength of 510 nm (in vacuum) shines through the slit and produces a diffraction pattern. The width of the central bright fringe on the screen is 0.050 meters. What is the width of the slit?

2. A spotlight sends red light (wavelength of 694.3 nm) to the moon. At the surface of the moon, which is 3.77×10^8 meters away, the light strikes a reflector left there by astronauts. The reflected light returns to the earth, where it is detected. When it leaves the spotlight, the circular beam of light has a diameter of about 0.20 meters, and diffraction causes the beam to spread as the light travels to the moon. In effect, the first circular dark fringe in the diffraction pattern defines the size of the central bright spot on the moon. Determine the diameter (not the radius) of the central bright spot on the moon.