Optics

Name: _____

1. A projectile is fired at an angle of 28.0° to the horizon. Its initial velocity is 298 m/s. What is the range of the projectile?

2. A beam of light with a wavelength of 575 nm while traveling in air is incident on a slab of material. The angle of incidence is 28.0°. The refracted beam makes an angle of 20.4°. Find (a) the index of refraction for the slab and (b) the wavelength of the light in the slab.

3. A beam of laser light, wavelength 678.8 nm in air, is incident on a block of polystyrene at an angle of 29.7°. Find (a) the angle of refraction and (b) the wavelength of the light in the plastic.

4. A light wave with a wavelength of 612 nm in a vacuum travels through a bit of fused quartz which has an index of refraction of $n = 1.458$. Find the speed of light in the quartz.

5. Find the speed of light in (a) flint glass, (b) water, and (c) zircon.

6. Light of wavelength 436 nm in air enters a fishbowl filled with water, then exits through the crown-glass wall of the container. Find the wavelengths of the light in (a) the water and (b) the crown glass.

7. A 589nm beam of light is incident on the surface of some clean ice at an angle of 40.0° with the normal. Part of light is reflected and part is refracted. Find the angle between the reflected and refracted light.