Reflection and Refraction

Review the textbook on Reflection, Refraction, and Total Internal Reflection.

- **Phys 1402:** Serway/Vuille: Sections 22.2, 22.3, 22.7.
- **Phys 2426:** Serway/Jewett: Sections 35.4, 35.5, 35.8

1. Diamond has refractive index of 2.42. Calculate the speed of light in diamond. Assume $c = 300\times10^6$m/s.
(124×10^6m/s)

2. The refractive index of benzene at 20°C is 1.501. Light of wavelength 510nm enters from air into benzene; what is the wavelength of this light in benzene?
(340nm)

3. The refractive index of red light in crown glass is 1.49, while the refractive index of blue light in crown glass is 1.51. What light is deflected by the glass greater from the original path?
(Blue light)

4. A beam of light coming from water (n = 1.3) enters air (n = 1.0) at an angle of incidence $\theta_i = 30°$. Find the angle of refraction, θ_r.
(42°)

5. Find the critical angle for light traveling from water (n = 1.3) to air (n =1.0). Hint: For a critical angle the angle of refraction is 90° and the light glides along the surface.
(50°)

6. Sunlight enters a room at a certain angle above the horizontal and reflects from a small mirror lying flat on the floor. The reflected light forms a spot on a wall that is behind the mirror. If you place a pencil under the edge of the mirror nearer the wall, tilting it upward by a small angle, how the location of the spot will change? See Figure 1.
(The spot will move higher up along the wall)

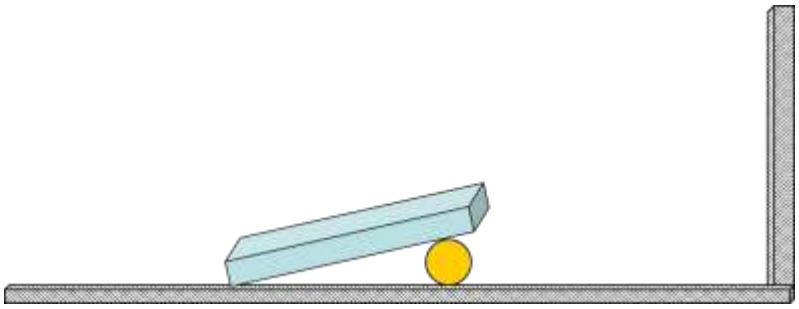

Figure 1: Tilted mirror