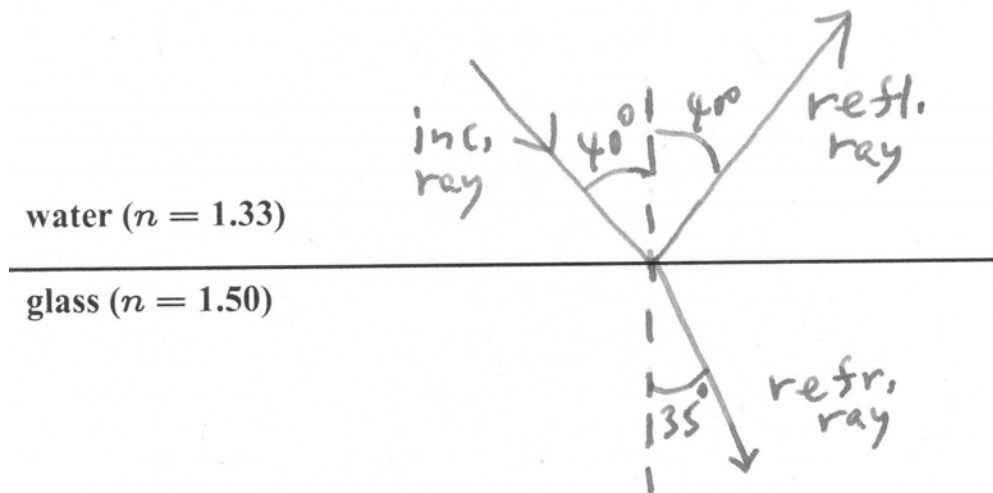


CLASS EXERCISE #17 - 18 July 2005

Light at an angle of incidence of 40° strikes a horizontal interface between water ($n = 1.33$) and glass ($n = 1.50$), coming from the water side.

(a) Draw a diagram showing the incident ray and then sketch the reflected and refracted rays and determine their angles from the normal to the surface.



The angle of reflection = the angle of incidence = 40° .

The angle of refraction can be found from Snell's law:

$$1.33 \sin 40^\circ = 1.50 \sin \theta_2$$

$$\Rightarrow \theta_2 = \sin^{-1}(1.33 \times 0.643/1.50) = \sin^{-1}(0.5699) = 34.7^\circ$$

(b) Repeat for light (at the same angle of incidence) coming from the glass side.

Angle of reflection = 40° ; angle of refraction found from

$$1.50 \sin 40^\circ = 1.33 \sin \theta_2$$

$$\Rightarrow \theta_2 = \sin^{-1}(1.50 \times 0.643/1.33) = \sin^{-1}(0.725) = 46.5^\circ.$$