Page 567 #1-3

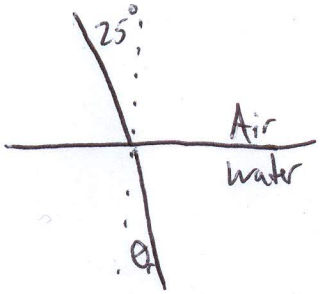
Snell's Law - used to determine the angle of refraction.

$$n_i(\sin\theta_i) = n_r(\sin\theta_r)$$

i = incidence n = index of refraction

r = refraction

#1.



$n_i = 1.000293$ (look at chart pg 564)

$\theta_i = 25°$

$n_r = 1.333$ (pg 564)

$\theta_r = ?$

apply formula

$(1.000293)(\sin 25°) = (1.333)(\sin\theta_r)$

$\frac{(1.000293)(\sin 25°)}{1.333} = \sin\theta_r$

$\sin^{-1}\left(\frac{1.000293 \cdot \sin 25°}{1.333}\right) = \theta_r$

$\theta_r = 18.58°$

* Check to see if calc is in Degrees.

~~Radian~~

Pg 567 #1-3 Snell's Law

#2. $n_i(\sin\theta_i) = n_r(\sin\theta_r)$

(a) $n_i = 1.66$ (chart pg ~~565~~ 564)

$\theta_i = 25^\circ$

$n_r = 1.52$ (chart pg ~~565~~ 564)

$\theta_r = ?$

$1.66 \cdot \sin 25^\circ = 1.52 \cdot \sin\theta_r$

$\frac{(1.66 \cdot \sin 25^\circ)}{1.52} = \sin\theta_r$

$\sin^{-1}\left[\frac{(1.66)\cdot(\sin 25^\circ)}{1.52}\right] = \theta_r$

$\boxed{\theta_r = 27.49}$

(b) $n_i = 1.000293$

$\theta_i = 14.5^\circ$

$n_r = ?$

$\theta_r = 9.80^\circ$

~~$(1.000293)(\sin 14.5^\circ)$~~

$(1.000293)(\sin 14.5^\circ) = n_r(\sin 9.80^\circ)$

$\frac{(1.000293)(\sin 14.5^\circ)}{\sin(9.80^\circ)} = n_r$

$n_r = 1.475$

Material = glycerine

$n_i = 1.000293$

$\theta_i = 31.6°$

$n_r = 2.419$

$\theta_r = ?$

$$1.000293 \cdot (\sin 31.6) = 2.419 \cdot \sin\theta_r$$

$$\frac{(1.000293)(\sin 31.6°)}{2.419} = \sin\theta_r$$

$$\sin^{-1}\left[\frac{1.00293 \cdot \sin 31.6°}{2.419}\right] = \theta_r$$

$$\boxed{\theta_r = 12.51°}$$

3.

Answer 1.47