Reminders 03-24-08:

-Exam Average 65.7%

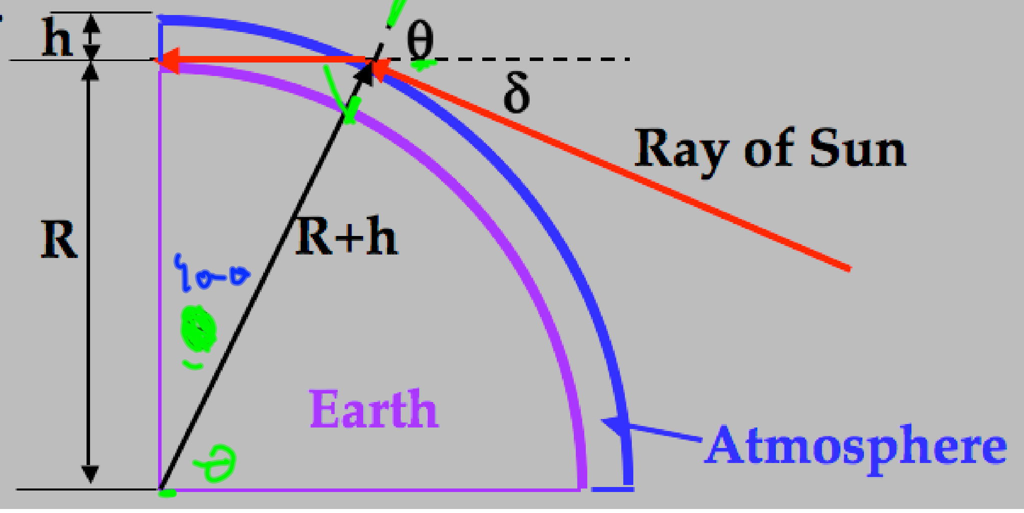
Some of you <u>REALLY</u> need to go over:

Exam Problem 1 and Hmwk Problem 16.26
Exam Problem 2 and Problem in Ch 15 Notes
Exam Problem 3 and Ch 16 Loudspeaker Problem
Exam Problem 4 and Any Doppler Effect Problem
Exam Problem 5 and Worksheet

-We will meet for lab this week! We will discuss image formation by mirrors (Ch 34) during lab!!

Outline:
-Examples of Refraction
-Polarization
-Scattering

When the sun rises or sets and appears to be on the horizon, it is actually below the horizon! As light enters our atmosphere it is bent due to the difference in n in each medium. We perceive that the light comes at an angle δ above the actual position. Assuming n_{atmos} is constant, calculate δ in terms of the quantities shown.



$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

$$\sin(\theta+\delta) = n_{atm} \sin\theta_2$$

$$\sin(\theta+\delta) = n_{atm} \sin\theta$$

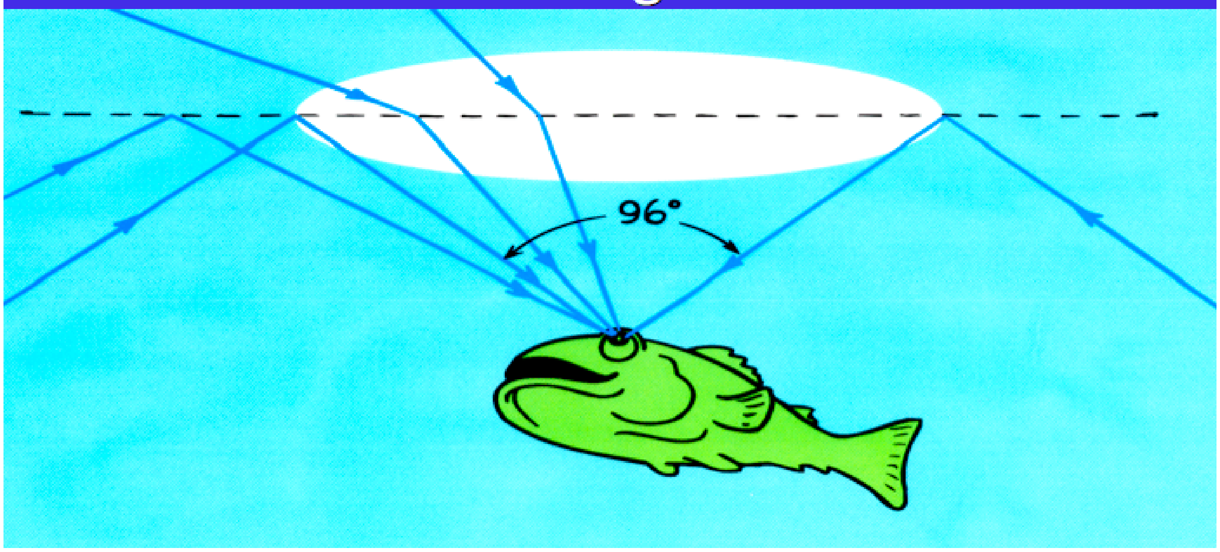
$$\theta+\delta = \sin^{-1}(n_{atm} \sin\theta)$$

$$\delta = \sin^{-1}(n \sin\theta) - \theta$$

$$\sin\theta = \frac{R}{R+h}$$

$$\delta = \sin^{-1}\left(\frac{nR}{R+h}\right) - \sin^{-1}\left(\frac{R}{R+h}\right)$$

- A beam of light travels from <u>water into air</u> (n=1.34). Find the angle of refraction. What is the critical angle?



$$\sin\theta_c = \frac{n_2}{n_1} = \frac{1}{1.34}$$

$$\theta_c = \sin^{-1}\frac{1}{1.34}$$

$$= \underline{48^\circ}$$

- A beam of vertically polarized light is incident on 3 polaroid films. The transmission axis of the 1st polarizer is at 0 degrees with respect to the vertical,the 2nd is at 40.0° with respect the the vertical, and the 3rd is at 75.0° with respect to the vertical. What percent of the incident light is transmitted through all three polaroids?

$I = I_0 \cos^2\theta$ if $\theta = 0$ then $I = I_0$

$I = I_0 \cos^2 40$

$I = (I_0 \cos^2 40) \cos^2 35° = .39$