Snell's Law Practice Name:_____

Date:

Snell determined that the angle at which light refracts (bends) as it travels into a new material depends on the speed of light in the two materials and the sine of the angle with the normal (perpendicular) line.

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

Where n_1 is the index of refraction of the first material multiplied by the sine of the angle in the first material and n_2 is the index of refraction of the second material multiplied by the sine of the angle in the second material.

For light of wavelength 589 nm (yellow):

Diamond	n=2.42	Water	n=1.33
Glass, crown	n=1.52	Air	n=1.00 (1.000293 technically)

1. Using the Snell's Law, determine the <u>angle of refraction in water</u> as light goes from air into water at an incident angle of 45°.

2. Using Snell's Law, determine the <u>angle of refraction in air</u> as light goes from diamond into air at an incident angle of 15°.

3. Repeat the previous question, but for a diamond immersed in water: determine the <u>angle of refraction in water</u> as light goes from diamond into water at an incident angle of 15°.

4. Using Snell's Law, determine the <u>angle of incidence in glass</u> for light to refract into air at an angle of refraction of 90.0° (just along the surface of the glass-air boundary).

Bonus: In #4 you found the "critical angle." What happens if the incident angle is greater than that??