Name: _____ Period: _____ Date: _____

Snell's Law Worksheet Total Points: ____ / 26

$$n = \frac{c}{v}$$

index of refraction = $\dfrac{speed\ of\ light\ in\ vacuum}{speed\ of\ light\ in\ medium}$

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

index of refraction in first medium · sine of the angle of incidence =
index of refraction in second medium · sine of the angle of refraction

Warning: If you calculator is not set to degrees, your entire worksheet will be incorrect

Using Sine

1. sin(0°) = _____ 2. sin(60°) = _____

3. sin(30°) = _____ 4. sin(90°) = _____

5. sin(15°) = _____ 6. sin(75°) = _____

7. sin(45°) = _____

Using the Inverse Sine
Solve for *x* in the following problems. *x* is going to be an angle measure in degrees, so be sure to include degrees in your answer.

8. sin(*x*) = 0   x = _____ 9. sin(*x*) = 0.60   x = _____

10. sin(*x*) = 0.30   x = _____ 11. sin(*x*) = 0.90   x = _____

12. sin(*x*) = 0.15   x = _____ 13. sin(*x*) = 0.45   x = _____

14. sin(*x*) = -1.01 x = _____ 15. sin(*x*) = 1.01   x = _____

16. What do your answers to problems 14 and 15 tell you about how the *inverse sine* function works? _____

_____

_____

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17. Find the angle of refraction for a ray of light that enters a bucket of water (n = 1.333) from air (n = 1.000) at an angle of 25° to the normal.

Knowns   **Unknowns**   **Formula**

18. Find the angle of refraction of a ray of light that enters a diamond (n = 2.419) from air at an angle of 15° to the normal.

Knowns   **Unknowns**   **Formula**

19. A red laser beam travels from flint glass (n = 1.61) into lemon oil. The angle of incidence is 40° and the angle of reflection is 44°.

   a. What is the refractive index of lemon oil?

   b. What is the speed of light in lemon oil?

Knowns   **Unknowns**   **Formula**

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