**Index of Refraction & Snell’s Law Classwork 5/5/14 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*Make sure to show all of your work!* **Date \_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_**

c = 3.00 x 108 m/s Snell’s Law: n1sin(θ1) = n2sin(θ2)

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| **Table 1: Indices of Refraction for Selected Media** | |
| **Medium** | **Index of Refraction** |
| Vacuum | 1.0000 (exact) |
| Air | 1.0003 |
| CO2 | 1.0005 |
| Water | 1.33 |
| Ethyl Alcohol | 1.36 |
| Pyrex glass | 1.47 |
| Plexiglass | 1.49 |
| Table Salt | 1.51 |
| Flint Glass | 1.61 |
| Ruby | 1.779 |
| Sapphire | 1.794 |
| Cubic Zirconia | 2.17 |
| Diamond | 2.42 |

1. Calculate the speed of light in the following media:
   1. Water (ans: v = 2.26 x 108 m/s)
   2. Diamond
2. Calculate the refractive index for a substance if the speed of light in that medium is
   1. 2.12 x 108 m/s (answer: n = 1.42)
   2. 1.59 x 108 m/s
3. When light passes from air into water at an angle of 60° from the normal, what is the angle of refraction? (ans: 40.6°)
4. When light passes from water into diamond at an angle of 45.0° from the normal, what is the angle of refraction?
5. A block of amber is placed in water and a laser beam travels from the water through the amber. The angle of incidence is 35° while the angle of refraction is 24°. What is the index of refraction of amber?

(ans: n = 1.88)

1. In an experiment, a jewel is placed in water. A laser beam is passed from the water through the jewel. The angle of incidence is 50.0°, and the angle of refraction is 28.0°. What is the index of refraction, and what type of jewel is it?