

Name: \_\_\_\_\_

Date: \_\_\_\_\_

PHY504-\_\_

## Snell's Law Worksheet

### Part A

1. When light passes from air into water at an angle of  $60^\circ$  from the normal, what is the angle of refraction? ( $40.6^\circ$ )
2. When light passes from air into water at an angle of  $30^\circ$  from the normal, what is the angle of refraction? ( $22.1^\circ$ )
3. When light passes from water into diamond at an angle of  $45^\circ$  from the normal, what is the angle of refraction? ( $22.9^\circ$ )
4. The refractive index of the lens of the human eye is 1.41. If a ray of light goes from the air into the lens at an angle of  $55^\circ$ , what is the angle of refraction? ( $35.5^\circ$ )

### Part B

1. In an experiment, a block of cubic zirconia is placed in water. A laser beam is passed from the water through the cubic zirconia. The angle of incidence is  $50^\circ$ , and the angle of refraction is  $27^\circ$ . What is the index of refraction of this cubic zirconia? ( $2.24$ )
2. A ray of light approaches a jar of honey at an angle of  $30^\circ$ . If the angle of refraction is  $19.5^\circ$ , what is the refractive index of honey? ( $1.50$ )
3. A block of amber is placed in water and a laser beam travels from the water through the amber. The angle of incidence is  $35^\circ$  while the angle of refraction is  $24^\circ$ . What is the index of refraction of amber? ( $1.88$ )
4. A red laser beam travels from flint glass into lemon oil. The angle of incidence is  $40^\circ$  and the angle of reflection is  $44^\circ$ . What is the refractive index of lemon oil? ( $1.49$ )

**Table 1. Index of Refraction for Selected Media**

Media	Index of Refraction
Vacuum	1.00 (exactly)
Air	1.0003
Carbon dioxide gas	1.0005
Water	1.33
Alcohol	1.36
Pyrex glass	1.47
Plexiglas	1.49
Table salt	1.51
Flint glass	1.61
Sapphire	1.77
Cubic zirconia	2.16
Diamond	2.42
Gallium phosphide	3.50