Physics 11: Snell’s Law, Refraction of Light.

1. Light travels from air to water (n=1.3). The angle of incidence is 28o, find the angle of refraction.

2. Light travels from water (n=1.3) to glass (n=1.5). The angle of refraction is 57o. What was the incident angle?

3. Light travels from air, at 62.0o from the normal, into a transparent material. The refracted ray travels at an angle of 54.0o relative to the normal. What is the refractive index of the transparent material?

4. Light travels from air, at 47.5o from the normal, into a transparent material. The refracted ray travels at an angle of 40.2o relative to the normal. What is the speed of light in the transparent material?

5. Light travels from Jell-O into ice. The ratio of the index of refraction of ice to the index of refraction for Jell-O is 0.874. The angle of refraction is 26o, what is the angle of incidence?

6. Light travels from diamond into water. The ratio of the index of refraction of water to the index of refraction for diamond is 0.560. The angle of incidence is 11.0o, what is the angle of refraction?

7. Find the critical angle for a glass (n=1.6) to water (n=1.3) boundary.

8. A light wave travels from air into a triangular block of plastic as shown below. Find the n value of the plastic.

\*NOTE 14o is not the angle of refraction!\*

14o

30.0o

Sketch the path of the light leaving the plastic.

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9. The same block of plastic from question 8 is now placed into a tank of fluid with an n value of 1.33.

A light wave travels from the liquid into the triangular block of plastic as shown below.

30.0o

A. Sketch the path of the light through the plastic.

B. Sketch the path of the light as it exits the plastic.

C. Find the angle of refraction as the light enters the plastic.

D. Find the angle of refraction as the light leaves the plastic.

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