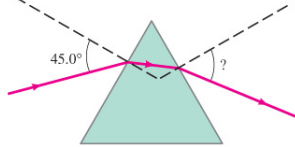


PHY114 S09 Problem Set 9

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1. The speed of light in ice is 2.29×10^8 m/s. What is the index of refraction of ice?
2. What is the speed of light in ethyl alcohol? What is the speed of light in lucite? What is the speed of light in crown glass? (Look up the values of their index of refraction.)
3. Light is incident on an equilateral glass prism at a 45.0° angle to the normal of one face.



Calculate the angle at which light emerges from the opposite face. Assume that the refractive index of this glass is 1.54.

4. A laser beam of diameter $d = 2.8$ mm in air has an incident angle $a = 27^\circ$ at a flat air-glass surface. If the index of refraction of the glass is $n = 1.5$, determine the diameter d_2 of the beam after it enters the glass.
5. A solar cooker, really a concave mirror pointed at the Sun, focuses the Sun's rays 18.7 cm in front of the mirror. What is the radius of the spherical surface of which the mirror is a part?
6. You are standing 3.9 m from a convex security mirror in a store. You estimate the height of your image to be half of your actual height. Estimate the radius of curvature of the mirror.