

Section

15-3

HOLT PHYSICS

Concept Review

Optical Phenomena

Indices of Refraction for Various Substances

<i>Substance</i>	<i>n</i>
Diamond	2.419
Sodium chloride	1.544
Glycerine	1.473
Fluorite	1.434

<i>Substance</i>	<i>n</i>
Ethyl alcohol	1.361
Water	1.333
Air	1.000

1. A light ray inside a diamond strikes the boundary with air at 20.0° from the normal.

a. Calculate the angle of refraction of that light ray.

b. What happens when the incident angle is 32.0° ?

c. What is the critical angle for this light traveling from diamond to air?

d. The diamond is immersed in water. The same light ray strikes the diamond-water boundary at a 20.0° angle. Answer items a, b, and c for this case.

2. Glass prisms with 90° , 45° , 45° angles are used in periscopes because light entering the right-angle side undergoes internal reflection on the 45° side of the prisms. What happens if the sides of the prisms are made of thin glass and the prisms are filled with water? Use the critical angle of water to answer.

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