

Exam in a Can Snell's & θ_c

Copyright © 1984-1993 by ips Publishing, Inc.

Physics Skills
ips Publishing, Inc.

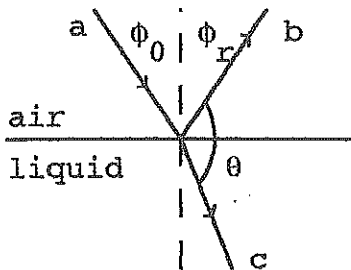
04-20-1994

Form A-A

Page 1

Show all work - Use extra sheets if necessary

1. A ray of light strikes a mirror at an angle of 17° to the normal.
 - a) What is the angle of reflection?
 - b) What is the angle between the incident ray and the reflected ray?
2. A ray of light has an angle of incidence of 27.2° on a block of quartz and an angle of refraction of 16.6° . What is the index of refraction for this block of quartz?
3. A laser produces a ray of light which moves through the air and enters the clear liquid at an angle of $\phi_0 = 39^\circ$ with respect to the normal. The liquid's index of refraction is 1.5. Find the angle θ between the reflected ray (b) and the refracted ray (c).



4. A beam of light strikes the flat, glass side of a water-filled aquarium at an angle of 37.0° to the normal. For this glass $n = 1.53$ and for water $n = 1.33$. At what angle does the beam
 - a) enter the glass?
 - b) enter the water?
5. What is the index of refraction of a substance if the speed of light is 1.63×10^8 m/s in the substance?
6. What is the critical angle for a material if a ray of light approaching the material in air makes an angle of incidence of 60.0° and an angle of refraction in the material of 42.0° ? All angles are measured with respect to the normal.
7. The critical angle for special glass in air is 41.6° . What is the critical angle if the glass is immersed in water? (For water use $n = 1.33$)

8. Trace the path of the ray in going through the glass prism from the air. Show all normals and angles

