

PRACTICE A

Snell's Law

1. Find the angle of refraction for a ray of light that enters a bucket of water from air at an angle of 25.0° to the normal. (Hint: Use **Table 1.**)
2. For an incoming ray of light of vacuum wavelength 589 nm, fill in the unknown values in the following table. (Hint: Use **Table 1.**)

	from (medium)	to (medium)	θ_i	θ_r
a.	flint glass	crown glass	25.0°	?
b.	air	?	14.5°	9.80°
c.	air	diamond	31.6°	?

3. A ray of light of vacuum wavelength 550 nm traveling in air enters a slab of transparent material. The incoming ray makes an angle of 40.0° with the normal, and the refracted ray makes an angle of 26.0° with the normal. Find the index of refraction of the transparent material. (Assume that the index of refraction of air for light of wavelength 550 nm is 1.00.)

SECTION REVIEW

1. Sunlight passes into a raindrop at an angle of 22.5° from the normal at one point on the droplet. What is the angle of refraction?
2. For each of the following cases, will light rays be bent toward or away from the normal?
 - a. $n_i > n_r$, where $\theta_i = 20^\circ$
 - b. $n_i < n_r$, where $\theta_i = 20^\circ$
 - c. from air to glass with an angle of incidence of 30°
 - d. from glass to air with an angle of incidence of 30°
3. Find the angle of refraction of a ray of light that enters a diamond from air at an angle of 15.0° to the normal. (Hint: Use **Table 1.**)
4. **Critical Thinking** In which of the following situations will light from a laser be refracted?
 - a. traveling from air into a diamond at an angle of 30° to the normal
 - b. traveling from water into ice along the normal
 - c. upon striking a metal surface
 - d. traveling from air into a glass of iced tea at an angle of 25° to the normal