

Chap 35: Geometric optics (Rays)

Example 1: Two mirrors form a 60° angle. If a beam strikes the first mirror at an incident angle of 40° , what is the angle between the incoming and outgoing beams?

Example 2: A rotating mirror turns through an angle q ; through what angle does the beam rotate?

Example 3: A ray strikes a piece of glass ($n = 1.55$) at an incident angle of 40° . What is the angle of refraction?

Example 4: A ray travels from air to fused quartz ($n = 1.46$). If the refracted ray makes an angle of 37° to the normal, what was the incoming angle?

Example 5: A ray strikes the boundary between air and diamond ($n = 2.42$). What is the incident angle if the angle between the reflected ray and the refracted ray is 90° ?

Example 6: A beam of green light strikes a glass prism ($n = 1.54$) whose apex angle is 60° . Calculate the angle of deviation for the beam.

Example 7: A white beam strikes the boundary between air and glass ($n_r = 1.615$ and $n_b = 1.650$) at an angle of 53° . What is the angle of the beam dispersion inside the glass?

Example 8: What is the critical angle for a water ($n = 1.33$) and glass ($n = 1.55$) boundary?

Example 9: A ray strikes the upper surface of a glass cube at an incident angle of 40° . What is the index of refraction if total internal reflection occurs at the sidewall of the cube?