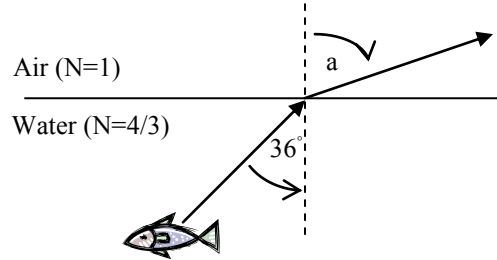
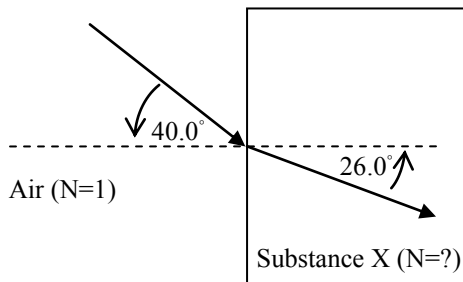


Physics 11
Refraction WS

1. A beam of light travels from a fish to the surface and exits a pond into the air as drawn below. Find the angle “a” in the drawing below:

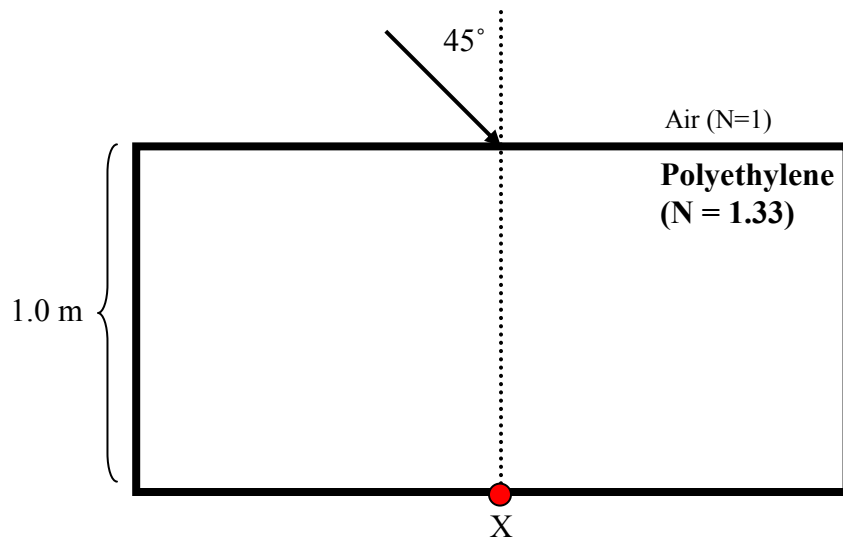


1. A beam of light of wavelength $5.50 \times 10^{-7} \text{ m}$, traveling in air, is incident on a slab of transparent material, “Substance X”. The incident beam makes an angle of 40.0° with the normal, and the refracted beam makes an angle of 26.0° with the normal.
(a) Find the index of refraction of the material. (b) What is the speed of the light in the material? (c) Which of the following variables does NOT change when light goes from the air into the material: WAVELENGTH or FREQUENCY?



1. Light from a sodium lamp has a wavelength of $6.09 \times 10^{-7} \text{ m}$ in a vacuum. This light hits a piece of fused quartz perpendicular to the surface of the quartz. The quartz has an index of refraction $n = 1.84$. (a) Find the speed of light in the quartz. (b) Find the angle of refraction for the beam of light relative to the normal.

2. How far to the right of point X with the light leave the polyethylene block?



3. Determine the angle of the angle “a” in the diagram below: (hint: you’ll need to find the angles marked by *)

