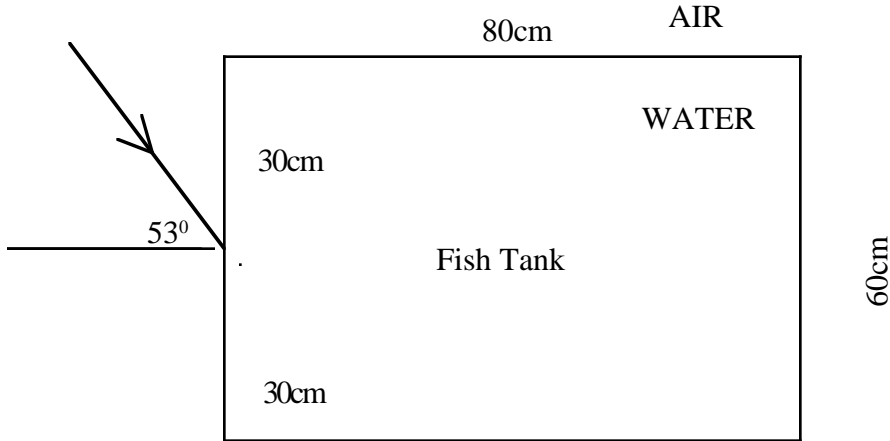


Reflection and Refraction Quiz 1.0H

1. Shown here is the top view of a fish tank filled with water ($n=1.33$). Shown on the left is a laser beam with an angle of incidence of 53° . (a) Find the critical angle for light moving in water toward a smooth interface with air. (b) Copy the diagram shown and show all the reflected and refracted rays of light. (c) Show where the light beam hits any (if any) of the other walls of the tank. (Disregard the effects of the thin glass walls.)



2. How deep is a coin if it “appears” to be 20 cm deep at the bottom of the fish tank? Assume that the angle of the refracted light (from the coin) into the air is 41.7° with the normal. This is the ray that hits the eye of the observer. For water, $n=1.33$. Be sure to draw a ray diagram.

3. Shown below are three mediums ($n_{\text{glass}}=1.5$, $n_{\text{water}}=1.33$ and $n_{\text{air}}=1$). A ray of light is shown to be incident on the glass-water interface at a 45° angle. Redraw the diagram and show all the reflected and refracted rays and their corresponding angles of reflection and refraction.

