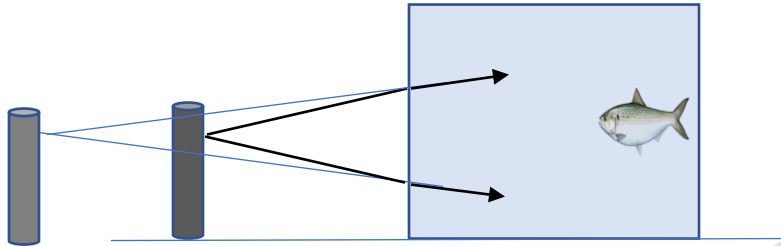


Q- A fish in a flat-sided aquarium sees a can of fish food on the counter. To the fish's eye, the can looks to be 30 cm outside the aquarium. What is the actual distance between the can and the aquarium? (You can ignore the thin glass wall of the aquarium.)

The problem is solved by the formula for the apparent depth in the text the only difference is that the fish is in water and sees the can placed in air and hence we have to take refractive index of air with respect to water thus for normal incidence



$$\mu_{\text{water}} \mu_{\text{air}} = \text{real depth/virtual depth}$$

$$\text{Or } \mu_{\text{air}}/\mu_{\text{water}} = \text{real depth/virtual depth}$$

$$\text{Or } 1/1.33 = \text{real distance}/30 \text{ cm}$$

$$\text{Gives real distance} = 30/1.33 = 22.56 \text{ cm}$$