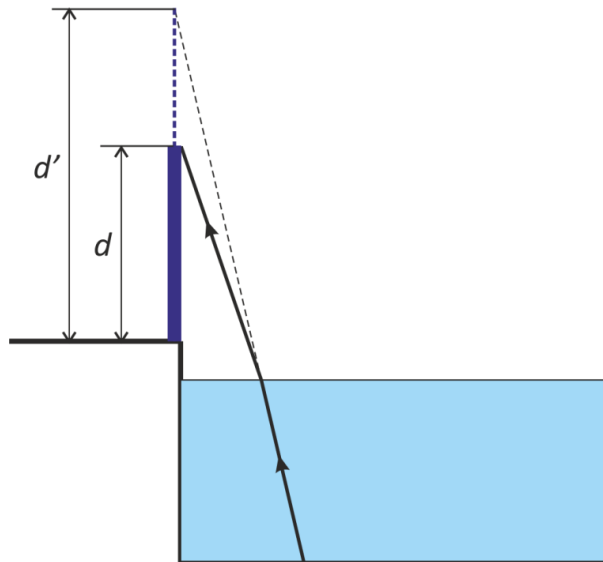


Answer on Question #40377, Physics, Optics

Suppose you are inside the water in a swimming pool near an edge. A friend is standing on the edge. Do you find your friend taller or shorter than his usual height?

Solution:

This diagram shows the person of height d as seen from the pool (apparent height d'):



From below water, objects in air are virtual images that have an apparent position (height in air) greater than their real position.

The apparent height d' can be found from the formula

$$d' = d \frac{n_2}{n_1}$$

where d is the actual height and n_2 and n_1 are the refraction indices of the water and air, respectively.

Answer. The friend will seem taller than usual height.