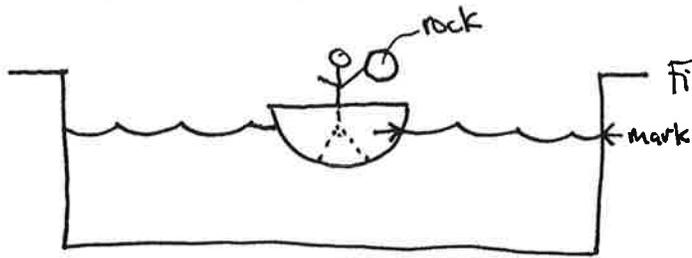


## ASQV2 Ex 15.3 (Canoe Conundrum)



First, does the water rise above, or fall below, the level of the mark on the canoe?

When the rock is thrown out, there is less weight in the boat, so it needs to displace less volume of water in order to create sufficient buoyant force to support the weight in the canoe. Therefore the water falls below the level of the mark on the canoe.

Now, does the water rise above, or fall below, the mark on the side of the pool? The answer: it falls below. Why. Consider this in two steps. First, the rock is removed from the canoe and set on the side of the pool (out of the water). When the canoe rises out of the water, the water falls below the mark on the side of the pool. By how much? The canoe had to displace enough water previously to keep it afloat. Since the density of rock is greater than water, it had to displace more water than the volume of the rock. So the level of the pool falls "a lot". Now, the second step: the rock is kicked into the pool. The water level rises, but only by the volume of the rock, which is not as much as it fell in step 1.