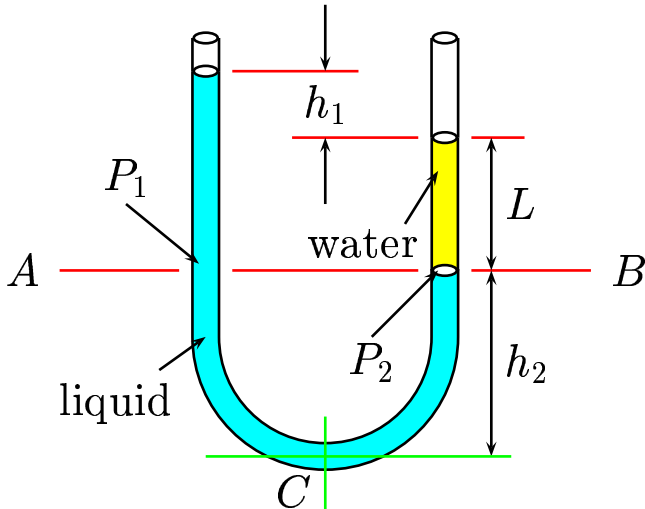


A U tube is filled with a liquid and water. Here the water is denser than the liquid. See the sketch. The horizontal line \overline{AB} is at the level of the the water-liquid interface.



Compare the pressure P_2 , which the water column exerts on the liquid at the interface, and the pressure P_1 , which the liquid column at the left tube above the line \overline{AB} exerts on the liquid below it.

- A) $P_1 < P_2$.
- B) $P_1 = P_2$.
- C) $P_1 > P_2$.

Denote P_0 to be the atmospheric pressure.

At point C, which is at the bottom of the U-tube and it is a static point, the pressure from the left must be the same as the pressure from the right. This implies that

$$P_0 + \rho_{liquid} g (h_1 + L + h_2) = P_0 + \rho_{water} g L + \rho_{liquid} g h_2 . \quad (1)$$

Since

$$P_1 = P_0 + \rho_{water} g L$$

and

$$P_2 = P_0 + \rho_{liquid} g (h_1 + L) ,$$

we see Eq. (1) implies

$$P_1 = P_2 .$$

Answer B