Consider containers with liquid and blocks.

Case A: Block 1 is floating on the liquid. The submerged volume $x\,V_1 = V_L$ where V_1 is the volume of block 1, and V_L displaced volume of the liquid.

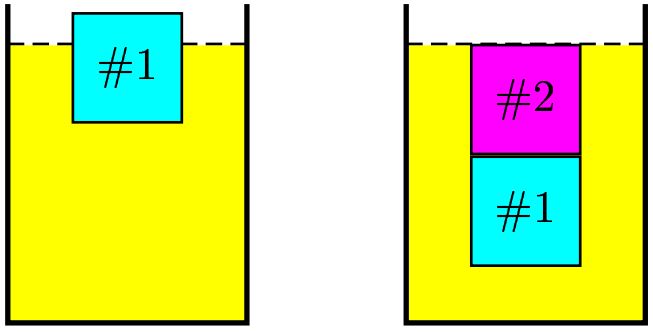
Case B: Block 1 and Block 2 are submerged in the liquid.

Notations:

Liquid) density: ρ_L, volume: V_L .

Block 1) density: ρ_1, volume: V_1 .

Block 2) density: ρ_2, volume: V_2 .



(A) (B)

Choose the correct relationship between densities.

A) $\rho_1 = x\,\rho_L$.

B) $x\,\rho_1 = \rho_L$.

Since block 1 is floating, Archimedes' principle implies that the weight of the block equals the weight of the displaced liquid, *i.e.*,

$$m_1\, g = m_L\, g\,.$$

This leads to

$$\rho_1\, V_1 = \rho_L\, V_L = \rho_L\, x\, V_1\,.$$

Thus

$$\rho_1 = x\, \rho_L\,.$$

Answer **A**

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