

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.

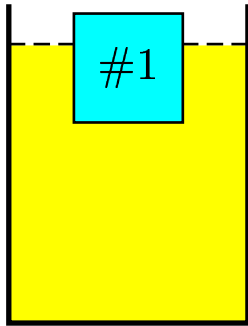
Case B: Block 1 and Block 2 are submerged in the liquid.

Notations:

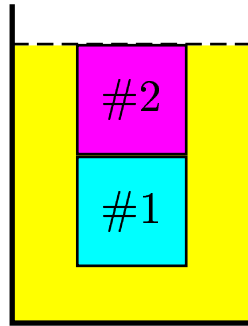
Liquid) density: ρ_L , volume: V_L .

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**