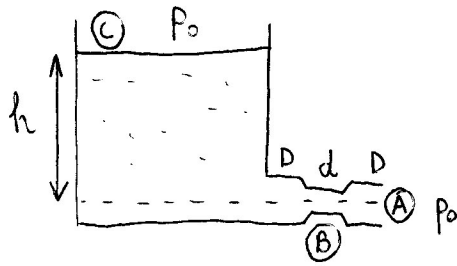


109.

$h = 1\text{m}$     $D = 5\text{cm}$     $d = 4\text{cm}$     $\rho = 1000 \frac{\text{kg}}{\text{m}^3}$



a) (i)  $v_A = ?$       b)  $p_B = ?$

(ii)  $\frac{\Delta V}{\Delta t} = ?$

$$p + \frac{1}{2} \rho v^2 + \rho gh = \text{'all'}$$

$$Av = \text{'all'}$$

a) (i)

$$p_A + \frac{1}{2} \rho v_A^2 + \rho gh_A = p_C + \frac{1}{2} \rho v_C^2 + \rho gh_C \quad p_A = p_C = p_0 \quad v_C \approx 0$$

$$p_0 + \frac{1}{2} \rho v_A^2 + 0 = p_0 + 0 + \rho gh$$

$$v_A = \dots$$

(ii)

$$\frac{\Delta V}{\Delta t} = \frac{Av \Delta t}{\Delta t} = Av \quad A_A v_A = \frac{D^2}{4} \pi v_A = \dots$$

b)

$$A_A v_A = A_B v_B$$

$$v_B = \frac{A_A}{A_B} v_A = \dots$$

$$p_0 + \frac{1}{2} \rho v_A^2 = p_B + \frac{1}{2} \rho v_B^2$$

$$p_B = p_0 - \frac{1}{2} \rho (v_B^2 - v_A^2)$$

$$p_B = \dots$$