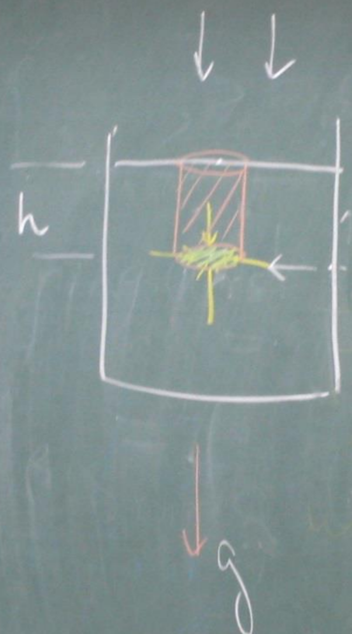


$$p = \frac{F}{A} \quad (N/m^2,\ \text{Pascal (Pa)})$$

$$p = \frac{F}{A} = \frac{\rho A h g}{A} = \rho g h$$

$\rho g h$

$N = m a$

kg m/

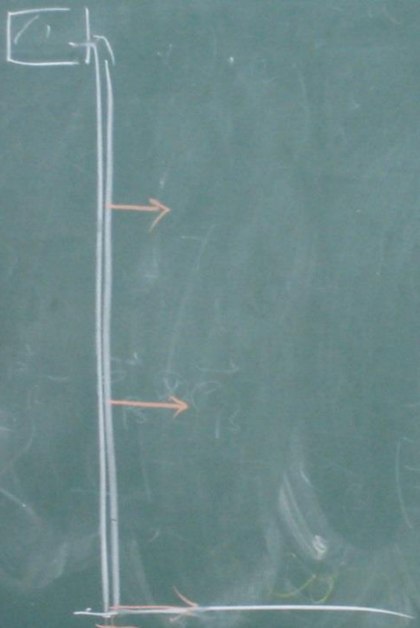
$N = m\,a$

$kg\;m/s^2$

$\rho g h$

$$[10^3\,kg/m^3][9.8\,m/s^2][30\,m] = 2.94\times10^5\,kg/s^2\text{-}m$$

$$= 2.94\times10^5\,N/m^2$$



$\rho \propto P$

$\rho_0 \quad P_0$

$$\frac{\rho}{\rho_0} = \frac{P}{P_0} \qquad \rho_0 = 1.29\ \text{kg/m}^3$$

$$\rho = P\frac{\rho_0}{P_0}$$

$\rho g h$

$$\frac{dP}{dy} = -\rho g$$

$$= -g P \frac{\rho_0}{P_0}$$

$$\int_{P_0}^{P_h} \frac{dP}{P} = -\frac{\rho_0}{P_0} g \int_0^h dy \Rightarrow \ln\frac{P_h}{P_0} = -\frac{\rho_0}{P_0} g h$$

$$P_h = P_0 e^{-\frac{\rho_0}{P_0} g h}$$

$-\alpha h$

$$\frac{1}{\alpha} = \frac{P_0}{g\rho_0}$$

$$= 1.25\times10^{-4}\ \text{m}^{-1}$$

2m  dy

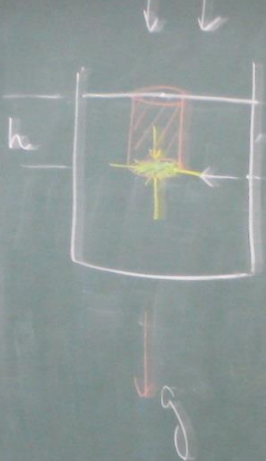
3m

W 1.764×10^{10} N

$$3\int_{y=0}^{2.0} \rho g y\, dy$$

$$= 3\rho g 2 = 6\times10^3 \times 9.8$$

$$= 5.88\times10^5\ \text{N}$$



$$p = \frac{F}{A} \quad (N/m^2 , \text{ Pascal } (Pa))$$

$$p = \frac{F}{A} = \frac{\rho A h g}{A} = \rho g h$$

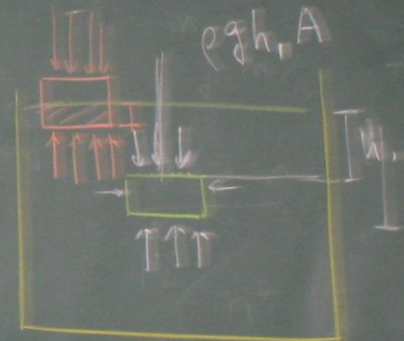
$$1\,\text{atm} = 1.013 \times 10^5\,N/m^2 = 101.3\,kPa = 1.013\,\text{bar}$$

$$6.079 \longrightarrow mg \rightarrow \rho V g$$

$$\downarrow$$

$$5.500 \qquad \frac{\rho V g}{(\rho - 1) V g} = \frac{\rho}{\rho - 1} = \frac{6.079}{5.50}$$

$$(6.079 - 5.5)\rho = 6.079$$



$\rho \propto P$

$\rho_0 \quad P_0$

$\frac{\rho}{\rho_0} = \frac{P}{P_0} \qquad \rho_0 = 1.29\,kg/m^3$

$\downarrow$

$\rho = P \frac{\rho_0}{P_0}$

$\rho g h$

$\frac{dP}{dy} = -\rho g$

$= -g P \frac{\rho_0}{P_0}$

$\int_{P_0}^{P_h} \frac{dP}{P} = -\frac{\rho_0}{P_0} g \int_0^h dy \Rightarrow \ln \frac{P_h}{P_0} = -\frac{\rho_0}{P_0} g h$

$P_h = P_0 e^{-\left(\frac{\rho_0}{P_0} g\right) h}$

$-\alpha h$

$\uparrow$

$\frac{1}{\alpha} = \frac{P_0}{g \rho_0}$

$= 1.25 \times 10^{-4}\, m^{-1}$

2m

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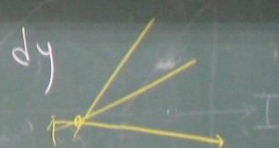


$= 3 \rho g 2 = 6 \times 10^3 \times 9.8$

$= 5.88 \times 10^5$ N

$$m = \rho A_1 \Delta l_1$$

$$= \rho A_2 \Delta l_2$$

$$\boxed{A_1 v_1 = A_2 v_2}$$

$$\frac{1}{2} m v_2^2 - \frac{1}{2} m v_1^2 = P_1 \cancel{A_1} \Delta l_1 - P_2 \cancel{A_2} \Delta l_2 - m g y_2 + m g y_1$$

$$\rho \cancel{A_2} \Delta l_2 \qquad \rho \cancel{A_1} \Delta l_1$$

$$\frac{1}{2} \rho v_2^2 - \frac{1}{2} \rho v_1^2 = P_1 - P_2 - \rho g y_2 + \rho g y_1$$

$$P_1 + \frac{1}{2} \rho v_1^2 + \rho g y_1 = P_2 + \frac{1}{2} \rho v_2^2 + \rho g y_2$$

$$\rho A_1 \Delta l_1$$

$$\rho A_2 \Delta l_2$$

$$P + \frac{1}{2} \rho v^2 + \rho g y = 常數$$

$m = \rho A_1 \Delta l_1$

$= \rho A_2 \Delta l_2$

$\boxed{A_1 v_1 = A_2 v_2}$

$$\frac{1}{2} m v_2^2 - \frac{1}{2} m v_1^2 = P_1 \cancel{A_1} \Delta l_1 - P_2 \cancel{A_2} \Delta l_2 - m g y_2 + m g y_1$$

$\rho \cancel{A_2} \Delta l_2 \quad \rho \cancel{A_1} \Delta l_1$

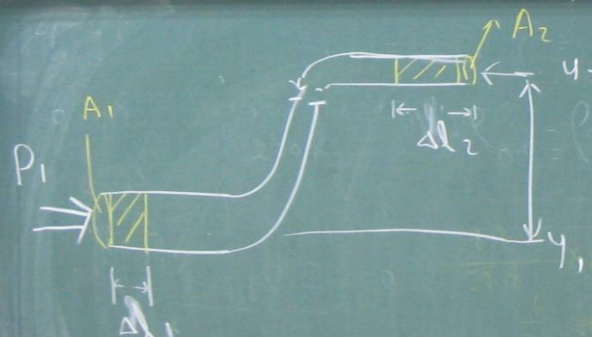
$$\frac{1}{2}\rho v_2^2 - \frac{1}{2}\rho v_1^2 = P_1 - P_2 - \rho g y_2 + \rho g y_1$$

$$P_1 + \frac{1}{2}\rho v_1^2 + \rho g y_1 = P_2 + \frac{1}{2}\rho v_2^2 + \rho g y_2$$

$\rho A_1 \Delta l_1$

$\rho A_2 \Delta l_2$

$$P + \frac{1}{2}\rho v^2 + \rho g y = 常數$$



$W_1 = P_1 A_1 \Delta l_1$

$W_2 = P_2 A_2 \Delta l_2$

$W_3 = -mg(y_2 - y_1)$

kg/m^3

gh

$10^3 \times 9.8$

$\times 10^5$ N