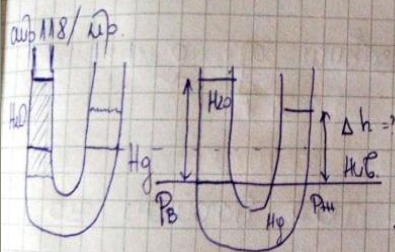


# Задачи од тема флуиди




$h_B = 32 \text{ cm} = 32 \cdot 10^{-2} \text{ m}$   
 $\rho_B = 10^3 \text{ kg/m}^3$   
 $\rho_H = 13,6 \cdot 10^3 \text{ kg/m}^3$   
 $\Delta h_H = ?$

$P_B = P_H$

$\rho_B g h_B = \rho_H g \Delta h_H$

$\Delta h_H = \frac{\rho_B h_B}{\rho_H} = \frac{10^3 \cdot 32 \cdot 10^{-2}}{13,6 \cdot 10^3} = 2,35 \cdot 10^{-2} \text{ m}$   
 $2,35 \text{ cm}$



$F_1 = 50 \text{ N}$   
 $F_2 = ?$   
 $\frac{S_2}{S_1} = 100$

$P_1 = P_2$   
 $\frac{F_1}{S_1} = \frac{F_2}{S_2}$

$F_2 = \frac{F_1 \cdot S_2}{S_1} = 50 \cdot 100 = 5 \cdot 10^3 \text{ N}$   
 $F_2 = 5 \text{ kN}$

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# Задачи од тема флуиди

аура 120/7

$$S = 4 \text{ cm}^2 = 4 \cdot 10^{-4} \text{ m}^2$$
$$h = 3 \cdot 10^2 \text{ m}$$
$$P_0 = 1,01 \cdot 10^5 \text{ Pa}$$
$$\rho = 10^3 \text{ Pa}$$
$$F = ?$$
$$P = P_0 + P_h$$
$$P_h = \rho g h$$
$$P_h = 10^3 \cdot 10 \cdot 3 \cdot 10^2$$
$$P_h = 3 \cdot 10^6 \text{ Pa}$$
$$P = (1,01 + 30) \cdot 10^5 \text{ Pa}$$
$$P = 31,01 \cdot 10^5 \text{ Pa}$$
$$F = P S$$
$$F = 31,01 \cdot 10^5 \cdot 4 \cdot 10^{-4}$$
$$F = 12404 \cdot 10$$
$$F = 1240,4 \text{ N}$$

аура 120/8

$$h = ?$$
$$P = 10^6 \text{ Pa}$$
$$\rho = 10^3 \text{ Pa}$$
$$P_h = \rho g h$$
$$h = \frac{P_h}{\rho g}$$
$$h = \frac{10^6}{10^3 \cdot 10} = 10^2 \text{ m}$$



# Задачи од тема флуиди

шп. 125 / шп.

Нивою е поедобјано

$$P_1 + \frac{\rho_1 v_1^2}{2} + \rho_1 g h_1 = P_2 + \frac{\rho_2 v_2^2}{2} + \rho_2 g h_2$$

$$\rho_1 g h_1 = \frac{\rho_2 v_2^2}{2} + \rho_2 g h_2 / 2$$

$$2 \rho_1 g h_1 = \rho_2 v_2^2 + 2 \rho_2 g h_2$$

$$v_2^2 = 2 g h_1 - 2 g h_2$$

$$v_2 = \sqrt{2 g h} \quad \text{— РКА НА ТОРИЧЕЛИ}$$

шп. 120 / шп.

$$m_1 = 15,58 \text{ g} = 15,58 \cdot 10^{-3} \text{ kg}$$

$$m_{\text{вода}} = 9,81 \text{ g} = 9,81 \cdot 10^{-3} \text{ kg}$$

$$\rho_{\text{вода}} = 10^3 \text{ kg/m}^3$$

$$m_1 = \rho_{\text{тело}} \cdot V$$

$$V = \frac{m_1}{\rho_{\text{тело}}}$$

$$F_A = G_{\text{вездах}} - G_{\text{вода}}$$

$$\rho_{\text{вода}} g V = m_1 g - m_{\text{вода}} g$$

$$\rho_{\text{вода}} V = m_1 - m_{\text{вода}}$$

$$\rho_{\text{в}} \cdot \frac{m_1}{\rho_{\text{тело}}} = m_1 - m_{\text{вода}}$$

$$\rho_{\text{тело}} = \frac{\rho_{\text{вода}} \cdot m_1}{m_1 - m_{\text{вода}}} = \frac{10^3 \cdot 15,58 \cdot 10^{-3}}{5,77 \cdot 10^{-3}} = 2,7 \cdot 10^3 \text{ kg/m}^3$$



# Задачи од тема флуиди

шр (20/12)

$G_{\text{воздух}} = 0,292 \text{ N}$   
 $G_{\text{вода}} = 0,272 \text{ N}$   
 $\rho_{\text{злато}} = 19,3 \cdot 10^3 \text{ kg/m}^3$   
 $\rho_{\text{сребро}} = 10,5 \cdot 10^3 \text{ kg/m}^3$   
 $m_{\text{злато}} = ?$   
 $m_{\text{сребро}} = ?$

I  $F_A = G_{\text{воздух}} - G_{\text{вода}}$   
 $\rho_{\text{вода}} g V = G_{\text{воздух}} - G_{\text{вода}}$   
 $V = \frac{G_{\text{воздух}} - G_{\text{вода}}}{\rho_{\text{вода}} \cdot g}$   
 $V = \frac{0,292 - 0,272}{10^3 \cdot 9,81} = 2,04 \cdot 10^{-6} \text{ m}^3$

II  $m_{\text{меса}} \cdot g = G_{\text{воздух}}$   
 $m_{\text{меса}} = \frac{G_{\text{воздух}}}{g}$   
 $m_{\text{меса}} = \frac{0,292}{9,81} = 0,029 \text{ kg} \approx 0,03 \text{ kg}$

III  $V_{\text{cp}} = V - V_{\text{зл}}$   
 $V_{\text{cp}} = 2,04 \cdot 10^{-6} - 1,14 \cdot 10^{-6}$   
 $V_{\text{cp}} = 0,9 \cdot 10^{-6} \text{ m}^3$

$m_{\text{меса}} = m_{\text{зл}} + m_{\text{среб}}$   
 $m_{\text{меса}} = \rho_{\text{зл}} V_{\text{зл}} + \rho_{\text{ср}} V_{\text{ср}}$   
 $V = V_{\text{ср}} + V_{\text{зл}}$   
 $V_{\text{ср}} = V - V_{\text{зл}}$

$m_{\text{меса}} = \rho_{\text{зл}} V_{\text{зл}} + \rho_{\text{ср}} (V - V_{\text{зл}})$   
 $m_{\text{меса}} = \rho_{\text{зл}} V_{\text{зл}} + \rho_{\text{ср}} V - \rho_{\text{ср}} V_{\text{зл}}$   
 $m_{\text{меса}} - \rho_{\text{ср}} V = V_{\text{зл}} (\rho_{\text{зл}} - \rho_{\text{ср}})$   
 $V_{\text{зл}} = \frac{m_{\text{меса}} - \rho_{\text{ср}} V}{\rho_{\text{зл}} - \rho_{\text{ср}}}$   
 $V_{\text{зл}} = \frac{0,03 - 10,5 \cdot 10^3 \cdot 2,04 \cdot 10^{-6}}{19,3 \cdot 10^3 - 10,5 \cdot 10^3}$   
 $V_{\text{зл}} = \frac{0,03 - 0,02}{8,8 \cdot 10^3} = \frac{0,01}{8,8 \cdot 10^3} = 1,14 \cdot 10^{-6} \text{ m}^3$

$m_{\text{зл}} = \rho_{\text{зл}} V_{\text{зл}}$   
 $m_{\text{зл}} = 19,3 \cdot 1,14 \cdot 10^{-3}$   
 $m_{\text{зл}} = 22 \cdot 10^{-3} \text{ kg}$   
 $m_{\text{зл}} = 0,022 \text{ kg}$

$m_{\text{ср}} = m_{\text{меса}} - m_{\text{зл}}$   
 $m_{\text{ср}} = 0,03 - 0,02$   
 $m_{\text{ср}} = 0,01 \text{ kg}$



# Задачи од тема флуиди

125/7

$$h = 100 \text{ m}$$

$$v = ?$$

$$V = ?$$

$$t = 1 \text{ h} = 3600 \text{ s}$$

$$R = 10 \text{ cm} = 10^{-2} \text{ m}$$

$$P_0 = P_a$$

$$v = \sqrt{2gh} = \sqrt{2 \cdot 10 \cdot 10^2} = \sqrt{2 \cdot 10^3} = 44,72 \text{ m/s}$$

$$V = S \cdot l = R^2 \pi \cdot v \cdot t$$

$$V = 10^{-4} \cdot 3,14 \cdot 44,72 \cdot 3600$$

$$V = 505514,88 \cdot 10^{-4} \text{ m}^3$$

$$\boxed{V = 50,5 \text{ m}^3}$$

125/8

$$P_1 = 7000 \text{ Pa}$$

$$P_2 = ?$$

$$v_1 = 0,6 \text{ m/s}$$

$$v_2 = 1 \text{ m/s}$$

$$\rho = 10^3 \text{ kg/m}^3$$

$$P_1 + \frac{\rho v_1^2}{2} = P_2 + \frac{\rho v_2^2}{2} \quad / \cdot 2$$

$$2P_1 + \rho v_1^2 = 2P_2 + \rho v_2^2$$

$$2(P_1 - P_2) + \rho(v_1^2 - v_2^2) = 0$$

$$P_2 = P_1 + \frac{\rho(v_1^2 - v_2^2)}{2}$$

$$P_2 = 7 \cdot 10^3 + 10^3(-0,36 + 1)$$

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$$P_2 = 10^3(7 + 0,64) = 6,36 \cdot 10^3 \text{ Pa}$$