

и ч вода и масса в  
трубы.

Дано:

$$\rho_B = 1 \frac{\text{г}}{\text{см}^3}$$

$$\rho_{\text{ж}} = 0,9 \frac{\text{г}}{\text{см}^3}$$

$$h = 4,5 \text{ см}$$

$$H = 15 \text{ см}$$

$$H_x = ?$$

Решение:

$$H_{\text{ж}} = H - h$$

$$\rho_B \cdot S \cdot h + \rho_{\text{ж}} \cdot S \cdot H_{\text{ж}} = \rho_B \cdot S \cdot h_x \quad | : S$$

$$H_{\text{ж}} = H - h$$

$$H_{\text{ж}} = 15 \text{ см} - 4,5 \text{ см} = 10,5 \text{ см}$$

$$h_2 = h_1 + h_2 - h_x$$

$$h_2 = 4,5 \text{ см} + 4,5 \text{ см} - h_x$$

$$h_2 = 9 \text{ см} - h_x$$

$$\rho_B \cdot (9 \text{ см} - h_x) + \rho_{\text{ж}} \cdot 10,5 \text{ см} = \rho_B \cdot h_x$$

$$1 \frac{\text{г}}{\text{см}^3} \cdot (9 \text{ см} - h_x) + 0,9 \frac{\text{г}}{\text{см}^3} \cdot 10,5 \text{ см} =$$

$$1 \frac{\text{г}}{\text{см}^3} \cdot h_x$$

$$9 - h_x + 9,45 = h_x$$

$$9 + 9,45 = 2h_x$$

$$h_x = 9,225 \text{ см}$$

$$\text{Ответ: } 9,225 \text{ см.}$$



$$D^2 = \lambda g \cdot S = \lambda g \cdot \left( \frac{F_{mp} + mg}{k} + L_0 \right)$$

$$Q = mgL_0 - m \left( \lambda g \left( \frac{F_{mp} + mg}{k} + L_0 \right) \right) =$$

$$= mgL_0 - \frac{2mg\lambda g L_0 k - 2F_{mp} g m - \lambda g^2 m^2}{k} = \frac{2mg\lambda g L_0 k - 2mg\lambda g L_0 k - 2(F_{mp} g m - g^2 m^2)}{k}$$

$$= \frac{mg(F_{mp} - mg)}{k}$$

Ответ:  $Q = \frac{mg(F_{mp} - mg)}{k}$

Дано:

- $L = 100 \text{ см}$
- $v_1 = 30 \frac{\text{см}}{\text{с}}$
- $v_2 = 70 \frac{\text{см}}{\text{с}}$
- $m_1 = m_2$

CU	N B
1 м	Движение:
$0,3 \frac{\text{м}}{\text{с}}$	$\vec{p}_1 + \vec{p}_2 = \vec{p}_1' + \vec{p}_2'$
$0,7 \frac{\text{м}}{\text{с}}$	$Q \cdot p = m \cdot v$

$$\vec{p}_1 + \vec{p}_2 = \vec{p}_1' + \vec{p}_2'$$

$$Q \cdot p = m \cdot v$$

$$m \vec{v}_1 + m \vec{v}_2 = m \vec{v}_1' + m \vec{v}_2' \quad / m$$

$$\vec{v}_1 + \vec{v}_2 = \vec{v}_1' + \vec{v}_2'$$

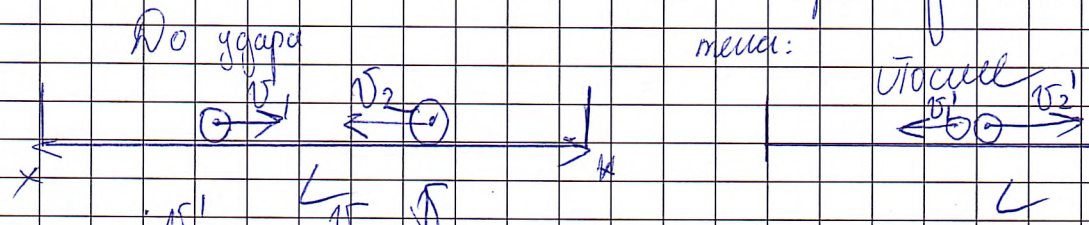
$$0,7 \frac{\text{м}}{\text{с}} - 0,3 \frac{\text{м}}{\text{с}} = v_1' - v_2'$$

$$0,4 \frac{\text{м}}{\text{с}} = v_1' - v_2'$$

$$v_1' = 0,4 \frac{\text{м}}{\text{с}} + v_2'$$

Рассмотрим движение до удара

ища:



$$v_2' = -v_1 + v_2$$

$$v_2' = 70 \frac{\text{см}}{\text{с}} - 30 \frac{\text{см}}{\text{с}} = 40 \frac{\text{см}}{\text{с}}$$

$$v_1' = 0,4 \frac{\text{см}}{\text{с}} + 0,4 \frac{\text{см}}{\text{с}} = 0,8 \frac{\text{см}}{\text{с}}$$

$$m_1 v_1 + m_2 v_2 = (m_1 + m_2) v_3$$

$$m_2 v_2 - m_1 v_1 = (m_1 + m_2) v_3$$

$$v_3 = \frac{m_2 v_2 - m_1 v_1}{m_1 + m_2} = \frac{m(0,7 \frac{\text{м}}{\text{с}} - 0,3 \frac{\text{м}}{\text{с}})}{2m} = \frac{0,4 \frac{\text{м}}{\text{с}}}{2} = 0,2 \frac{\text{м}}{\text{с}}$$

$$\vec{v}_1 + \vec{v}_2 = 50 \text{ m}$$

$$v_1 + v_2 = 50 \text{ m/m}$$

$$v_1 + v_2 = 50 \frac{\text{m}}{\text{s}}$$

$$40 \frac{\text{m}}{\text{s}} + v_2 + v_2 = 50 \frac{\text{m}}{\text{s}}$$

$$\rightarrow v_2 = 10 \frac{\text{m}}{\text{s}}$$

$$v_2' = 5 \frac{\text{m}}{\text{s}}$$

$$v_1' = 40 \frac{\text{m}}{\text{s}} + 5 \frac{\text{m}}{\text{s}} = 45 \frac{\text{m}}{\text{s}}$$

$$d) \quad t_1 = t_2 \quad t = \frac{s}{v} \quad t_1 = \frac{x}{v_1} \quad t_2 = \frac{L-x}{v_2}$$

$$\frac{x}{0,3} = \frac{L-x}{0,7}$$

$$0,3L - 0,3x = 0,7x$$

$$0,3L = 1x$$

$$0,3 = x$$

$$t_1 = t_2 = \frac{0,3 \text{ m}}{0,3 \text{ m/s}} = 1 \text{ s}$$

$$L - x = L - 0,3 \text{ m} = 0,7 \text{ m}$$

Bo 2 cizgi  $t_1 = t_2$  ;  $x_1 = x_2$

$$t_1 = \frac{x_1}{v_1} = \frac{x_2}{v_2}$$

$$x_1 = x_0 + v_0 t$$

$$x_1 = 0 + 45 \cdot t$$

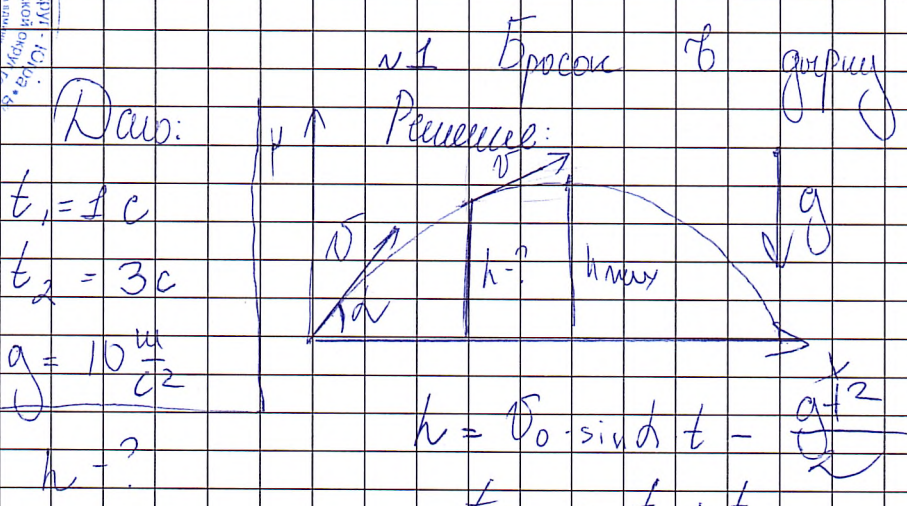
$$x_2 = \frac{0,3 \text{ m}}{0,45 \frac{\text{m}}{\text{s}}} = \frac{2}{3} \text{ s}$$

$$x_2 = \frac{2}{3} \cdot 5 \text{ m} = \frac{10}{3} \text{ s} = \frac{10}{3} + \frac{3}{10} = \frac{109}{30}$$

$$45 \frac{\text{m}}{\text{s}} = \frac{109}{30} \cdot 5 \frac{\text{m}}{\text{s}}$$

$$40 \frac{\text{m}}{\text{s}} = \frac{109}{30} \frac{\text{m}}{\text{s}}$$

$$t = 0,09 \text{ s}$$



Дано:

$t_1 = 1 \text{ c}$

$t_2 = 3 \text{ c}$

$g = 10 \frac{\text{м}}{\text{с}^2}$

$h = ?$

$$h = v_0 \cdot \sin \alpha \cdot t - \frac{g t^2}{2}$$

$$t_{\text{общ}} = t_1 + t_2$$

$$t_{\text{общ}} = 4 \text{ c}$$

$$t_{\text{общ}} = \frac{2 \cdot v_0 \cdot \sin \alpha}{g}$$

$$4 \text{ c} = \frac{2 \cdot v_0 \cdot \sin \alpha}{10 \frac{\text{м}}{\text{с}^2}}$$

$$40 \frac{\text{м}}{\text{с}} = 2 \cdot v_0 \cdot \sin \alpha$$

$$v_0 \cdot \sin \alpha = \frac{40}{2} = 20 \frac{\text{м}}{\text{с}}$$

$$h = 20 \frac{\text{м}}{\text{с}} \cdot 1 \text{ c} - \frac{10 \frac{\text{м}}{\text{с}^2} \cdot 1 \text{ c}^2}{2}$$

$$= 15 \text{ м}$$

Ответ: 15 м

Дано:

$m_1$

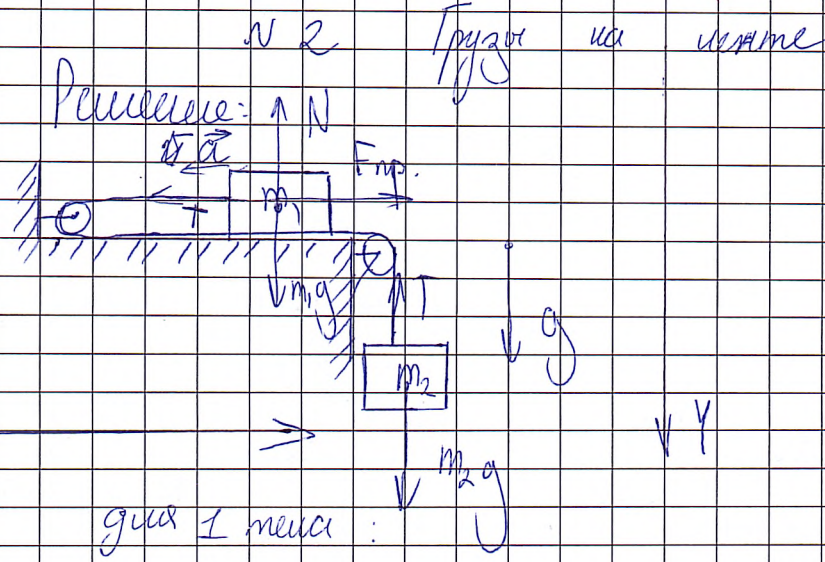
$m_2$

$\mu$

$g$

$a_1 = ?$

$a_2 = ?$



грав и трение:

$$OY: N = mg$$

$$OX: T - F_{mp} = m_1 a_1$$

$$F_{mp} = N \mu$$

$$N = mg$$

$$F_{mp} = \mu \cdot m \cdot g$$

$$OX: T - m_1 g \mu = m_1 a_1$$

$R_{\text{max}}$   $R$   $\mu$   $m_1$   $a_1$

$$OY: T = m_2 g$$

$$a_2 = 0$$

$$m_2 g - m_1 g \mu = m_1 a_1$$

$$a_1 = \frac{m_2 g - m_1 g \mu}{m_1} = g \frac{(m_2 - m_1 \mu)}{m_1}$$

$$\text{Imbom: } a_1 = 0; a_1 = \frac{g(m_2 - m_1 \mu)}{m_1}$$

$\sqrt{5}$   $\mu$   $m_1$   $a_1$   $m_2$   $g$   $m_1$   $\mu$   $m_1$

$R_{\text{max}}$

$m_1$

$F_0 = 0$

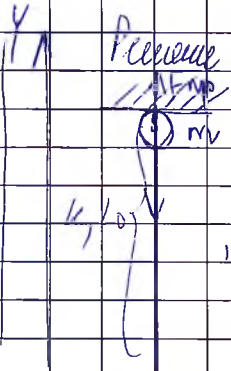
$F_{mp}$

$L_0$

$k$

$a$

$Q$



$$Q = mgh - \frac{mV^2}{2}$$

$$a = g$$

$$OY: F_{mp} + F_{mp} = -mg$$

$$F_{mp} + k \Delta x = -mg$$

$$\Delta x = \frac{F_{mp} + mg}{k}$$

$$S_{\text{pot}} = L_0 + \Delta x \quad S = L_0 + \frac{F_{mp} + mg}{k} \Delta x$$

$$S = \frac{k \Delta x^2}{2g} = \frac{k \Delta x^2}{2g}$$