

# Часть 1

Олимпиада: **Физика, 10 класс (1 часть)**

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ID профиля: **884758**

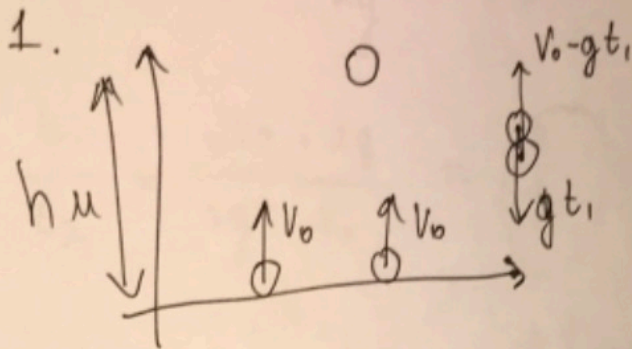
Вариант 2

Учуробун

Бизунд 10м.

Биринчи 10-02

1



$$t_{0.1} : v_0 - gt_0 = 0$$
$$t_0 = \frac{v_0}{g}$$

$$h_u = v_0 \cdot t_0 - \frac{gt_0^2}{2}$$

$$h_u = \frac{v_0 \cdot v_0}{g} - \frac{g \cdot \frac{v_0^2}{g^2}}{2} = \frac{v_0^2}{g} - \frac{v_0^2}{2g} = \frac{v_0^2}{2g}$$

1)  $t_{cm} : \frac{v_0^2}{2g} - \frac{gt_{cm}^2}{2} = v_0 t_{cm} - \frac{gt_{cm}^2}{2}$

$$h_u - v_0 t_{cm} = 0$$

$$\frac{v_0^2}{2g} - v_0 t_{cm} = 0 \quad | \cdot 2g$$

$$v_0^2 - 2v_0 t_{cm} g = 0$$

$$v_0 (v_0 - 2t_{cm} \cdot g) = 0$$

$v_0 \neq 0$

$$v_0 - 2t_{cm} \cdot g = 0$$

$$t_{cm} = \frac{v_0}{2g}$$

$$2) t_1 = t_{cm} + t_0 = \frac{V_0}{2g} + \frac{V_0}{g} = \frac{3V_0}{2g}$$

Микробух

$$t_2 = t_{cm} = \frac{V_0}{2g}$$

$$\frac{t_1}{t_2} = \frac{3V_0 \cdot 2g}{2g \cdot V_0} = \frac{3}{1}$$

$$3) h_{cm} = v_0 \cdot t_{ct} - \frac{g t_{cm}^2}{2}$$

$$h_{cm} = \frac{V_0^2}{2g} - g \frac{V_0^2}{4g^2} = \frac{V_0^2}{2g} - \frac{V_0^2}{8g} =$$

$$= \frac{V_0^2}{2g} - \frac{V_0^2}{8g} = \frac{3V_0^2}{8g}$$

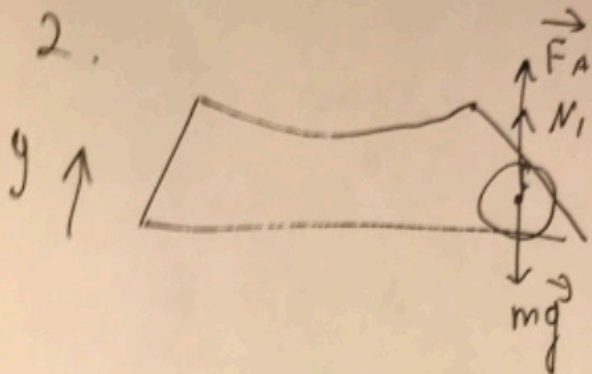
Answer: 1)  $\frac{3V_0}{2g}$       2) 3      3)  $\frac{3V_0^2}{8g}$

2

Учуробек

(3)

2.



$$\vec{N}_1 + \vec{F}_A + m\vec{g} = 0$$

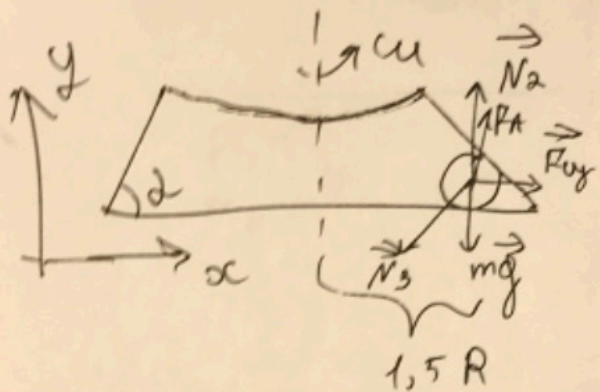
$$0y: N_1 + F_A = mg$$

$$N_1 = mg - F_A$$

$$m = \rho \cdot V = 6 \cdot \rho \cdot \frac{4}{3} \pi R^3$$

$$F_A = \rho g \cdot \frac{4}{3} \pi R^3$$

$$N_1 = 5 \cdot \rho \cdot \frac{4}{3} \pi R^3 g = \frac{20}{3} \pi R^3 \rho g$$



$$\vec{F}_{ay} = -m\vec{a}$$

$$\vec{F}_{ay} + \vec{N}_3 + \vec{N}_2 + \vec{F}_A + m\vec{g} = 0$$

$$0x: ma = N_3 \cdot \cos \alpha \quad (1)$$

$$0y: F_A + N_2 = N_3 \cdot \sin \alpha + mg$$

$$N_3 \cdot \sin \alpha = F_A + N_2 - mg \quad (2)$$

Тогонум (2) тед (1)

$$\operatorname{tg} \alpha = \frac{F_A + N_2 - mg}{ma} = \frac{3}{2} \Rightarrow$$

$$\Rightarrow N_2 = m(a \cdot \operatorname{tg} \alpha + g) - F_A$$

$$N_2 = \frac{4}{3} \pi R^3 \cdot 8 \rho \left( 6 \cdot \frac{27}{2} \omega^2 R + 5g \right)$$

Омбери: 1)  $\frac{20}{3} \pi R^3 \rho g$

2)  $8 \cdot \pi R^3 \cdot \frac{4}{3} \cdot \rho \left( 6 \cdot \frac{27}{2} \omega^2 R + 5g \right)$

Умножим

(4)

3.

$$T = \text{const}$$

$$T_0 = -8 \pm ^\circ\text{C}$$

$$V_1 = 1,7 \text{ л}$$

$$V_0 = 7 \cdot 1,7 \text{ л}$$

$$p_1 = 3,6 p_0$$

$$M = 18 \frac{\text{г}}{\text{моль}}$$

$$T = \text{const}$$

$$p_0 V_0 = p_1 V_1$$

$$p_0 V_0 = \frac{3,6}{7} p_0 V_0, \text{ неверно}$$

⇓

пар конденсируется

$p_0$  - ?  
 $m_0$  - ?

$$1) p = p_{\text{к}}$$

$$p_{\text{к}} = 3,6 p_0 \Rightarrow p_0 = \frac{p_{\text{к}}}{3,6} = \frac{0,5 \cdot 10^5}{3,6} =$$

$$= 13888 \text{ Па} = \boxed{13,9 \text{ кПа}}$$

2)

$$p_0 V_0 = \frac{m_0}{M} R T$$

$$m_0 = \frac{p_0 V_0 M}{R T}$$

$$p_{\text{к}} = \frac{V_0}{7} = \frac{m}{M} R T$$

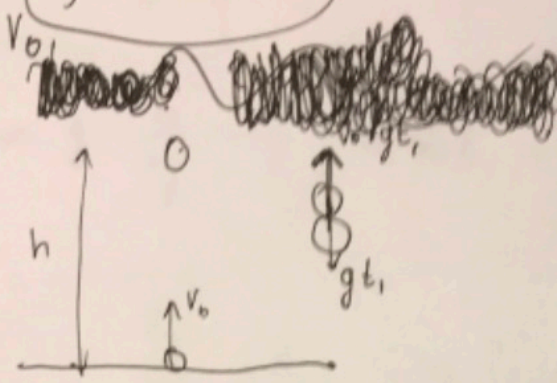
$$m_0 = \frac{p_0 \cdot 7 V \cdot M}{R T} = \frac{13,9 \cdot 10^3 \cdot 7 \cdot 1,7 \cdot 10^{-3} \cdot 18}{8,31 \cdot (273 + 8 \pm)}$$

$$= 1,012 \text{ г}$$

Ответ: 1) 13,9 кПа

2) 1,012 г

1. 1,0012 *Чепуха.*



$$v_0 - gt = 0$$

$$gt = v_0$$

$$t = \frac{v_0}{g}$$

$$v_0 - gt = 0$$

$$v_0 = gt$$

$$t = \frac{v_0}{g}$$

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

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

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

$$h = \frac{(v_0 - gt)^2 - v_0^2}{-2g}$$

3.  $v_1 = v_0$   
 $v_1 = 174$   
 $p_1 = 3,6 p_0$

$$h = \frac{v_0^2}{g} - \frac{v_0^2}{2g} = \frac{v_0^2}{2g}$$

$$h = h_m - gt$$

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

$$v_0^2 = \frac{v_0^2}{g} - \frac{v_0^2}{2g}$$

$$\frac{v_0^2}{g} = \frac{v_0^2}{2g}$$

$$v_0^2 g = \frac{v_0^2}{2}$$

$$s = \frac{v_1^2 + v_0^2}{2a}$$

$$h = \frac{(v_0 - gt)^2 - v_0^2}{-2g}$$

$$\frac{v_0^2 - (v_0 - gt)^2}{2g} = \frac{v_0^2 - v_0^2 + 2v_0gt - g^2t^2}{2g}$$

$$\frac{(v_0 - gt)^2 - v_0^2}{-2g} = \frac{v_0^2 - 2v_0gt + g^2t^2 - v_0^2}{-2g} = \frac{-2v_0gt + g^2t^2}{-2g}$$

$$= \frac{-2v_0t + gt^2}{-2} = \frac{2v_0t - gt^2}{2}$$

$$h_u = \frac{V_0^2}{2g}$$

$$V_0 - gt_0 = 0$$

$$t_0 = \frac{V_0}{g}$$

$$h_{cm} = \frac{V_0^2}{2g} - \frac{gt_1^2}{2} = V_0 t_1 - \frac{gt_1^2}{2}$$

$$\frac{V_0^2}{2g} - V_0 t_1 = 0 \quad | \cdot 2g$$

$$V_0^2 - 2V_0 g t_1 = 0$$

$$V_0 (V_0 - 2g t_1) = 0$$

$$V_0 - 2g t_1 = 0 \quad \Leftrightarrow V_0 \neq 0$$

$$V_0 - 2g t_1 = 0$$

$$V_0 = 2g t_1$$

$$t_1 = \frac{V_0}{2g}$$

①

~~(t\_2 = t\_1 + t\_0)~~

$$t_2 = t_1 + t_0 = \frac{3V_0}{2g}$$

$$h_{cm} = \frac{V_0^2}{2g} - \frac{g \cdot \frac{V_0^2}{4g^2}}{2} = \frac{V_0^2}{2g} - \frac{V_0^2}{4g} =$$

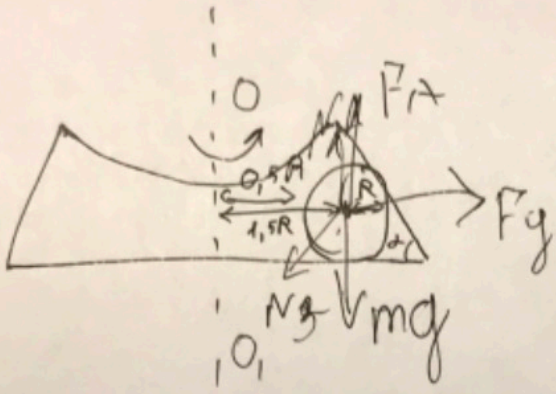
$$= \frac{V_0^2}{2g} - \frac{V_0^2}{8g} = \frac{3V_0^2}{8g}$$

③

Успехов

$$\frac{t_1}{t_2} = \frac{\frac{3v_0}{2g} + \frac{v_0}{g}}{\frac{v_0}{2g}} = \frac{\frac{3v_0}{2g}}{\frac{v_0}{2g}} = \frac{3}{1} \quad (2)$$

2.



$$\omega$$

$$\rho$$

$$6\rho$$

$$\operatorname{tg} \alpha = \frac{3}{2}$$

$$V_{\text{ш}} = \frac{4}{3} \pi R^3$$

$$m_{\text{ш}} = 6\rho \cdot V_{\text{ш}} = \frac{24}{3} \pi R^3 \rho$$

$$m_{\text{ш}} = \frac{24}{3} \boxed{8\rho \pi R^3}$$

$$P_{\text{ш}} = m_{\text{ш}} \cdot g = 8\rho \pi R^3 g$$

$$N_1 = mg - F_A$$

$$F_A = \rho \cdot g \cdot V = \frac{4}{3} \rho \cdot \pi R^3 \cdot g$$

$$P_{\text{ш}} = 8\rho \pi R^3 g$$

*Упробит*

$$N_1 = P_{\text{ш}} - F_A = \left(8 - \frac{4}{3}\right) \cdot \rho \cdot \pi R^3 g =$$

$$= \frac{20}{3} \left(\frac{24}{3} - \frac{4}{3}\right) \cdot \rho \cdot \pi R^3 g =$$

$$\boxed{N_1 = \frac{20}{3} \rho \pi R^3 g}$$



$$m_0 = \frac{\rho_0 \cdot V \cdot M}{RT} =$$

$$= \frac{13,9 \cdot 10^3 \cdot 7 \cdot 1,7 \cdot 10^{-3} \cdot 18}{8,31 \cdot (273 + 81)} =$$

$$= 1,012$$

13,9

$$\frac{13900 \cdot 7 \cdot 1,7 \cdot 10^{-3} \cdot 18}{8,31 \cdot (273 + 81)} = 1,012$$

354K

$$N_2 = m(\alpha \cdot \text{tg} \alpha + g) \cdot \frac{P}{A}$$

$$N_2 = \frac{4}{3} \cdot 8 \pi R^3 \cdot \rho \cdot (w^2 \cdot 1,5R + g)$$

$$N_2 = 8 \pi R^3 \cdot \rho \cdot (w^2 \cdot 2,25R + g)$$

Чертёнок

$$T = \text{const}$$

$$7V_1 = 4V_0$$

$$p_1 = 3,6 p_0$$

$$T = \text{const}:$$

$$p_0 V_0 = p_1 V_1$$

$$7V_1 = 4V_0$$

$$p_1 = 3,6 p_0$$

$$p_0 V_0 = p_1 V_1$$

$$p_0 V_0 = 3,6 p_0 \cdot \frac{V_0}{7}$$

$$7V_1 = 4V_0$$

$$p_1 = 3,6 p_0$$

$$T = \text{const}:$$

$$p_0 V_0 = p_1 V_1$$

$$3,6 p_0 V_0 = 7 p_0 V_1$$

$$V_1 = \frac{V_0}{7}$$

$$p_1 = 3,6 p_0$$

Чертавик

$$p_0 V_0 = \frac{3,6}{7} \cdot p_0 V_0 \text{ неверно}$$

пар конденсируется

$$p = p_{\text{н}}$$

$$p_{\text{н}} = 3,6 p_0 \Rightarrow p_0 = \frac{p_{\text{н}}}{3,6} = \frac{0,5 \cdot 10^5}{3,6} = 13888 \text{ Па}$$

$$= \boxed{13,9 \text{ кПа}}$$

$$p_0 V_0 = \frac{m_0}{M} RT$$

$$m_0 = \frac{p_0 V_0 M}{RT}$$

$$p_{\text{н}} \cdot \frac{V_0}{7} = \frac{m}{M} RT$$

$$m_0 = \frac{p_{\text{н}} \cdot \frac{V_0}{7} \cdot M}{RT}$$

$$\frac{V_0}{7} = V \Rightarrow V_0 = 7V$$

# Часть 2

Олимпиада: **Физика, 10 класс (2 часть)**

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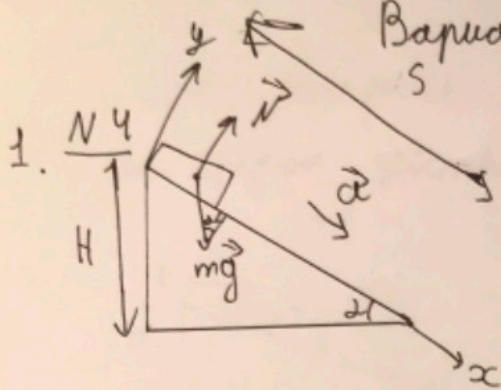
Вариант 2

Задание 1 Пузырек

10 м/с. 2

Вариант 10-02

$$\cos \alpha = \frac{3}{5}$$



$$m\vec{g} + \vec{N} = m\vec{a}$$

$$\text{ox: } ma = mg \cdot \sin \alpha$$

$$a = g \cdot \sin \alpha$$

$$\sin^2 \alpha + \cos^2 \alpha = 1$$

$$\sin^2 \alpha + \frac{9}{25} = 1$$

$$\sin \alpha = \frac{4}{5}$$

$$S = \frac{at^2}{2}$$

$$\frac{H}{5} = \sin \alpha = \frac{4}{5}$$

$$S = \frac{5}{4} H$$

$$\frac{5}{4} H = \frac{g \cdot \sin \alpha \cdot t^2}{2}$$

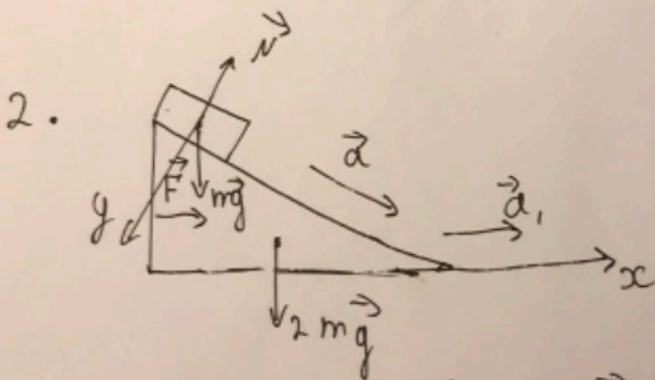
$$\frac{10}{4} H = g \cdot \sin \alpha \cdot t^2$$

$$\frac{2,5H}{g \cdot \sin \alpha} = t^2$$

$$t = \sqrt{\frac{2,5H}{g \cdot \sin \alpha}}$$

$$= \sqrt{\frac{2,5H}{g \cdot \frac{4}{5}}} = \sqrt{\frac{9,125H}{g}}$$

1



$$m\vec{a} = m\vec{g} + \vec{N}$$

$$\text{oy: } N = mg \cdot \cos \alpha$$

$$N = P \quad (\text{no III з.Н})$$

$$2m\vec{a} = \vec{F} + 2m\vec{g} + \vec{N}_1 + \vec{P}$$

$$\text{ox: } 2ma_1 = mg - P \cdot \cos \alpha$$

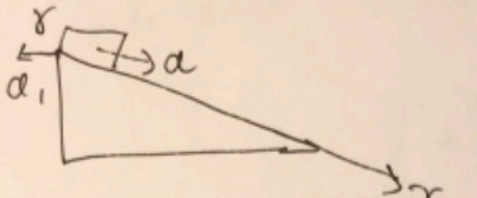
$$\frac{1}{2} - \frac{9}{25} = \frac{25-18}{50} = 0,14$$

$$\text{2) } a_1 = \frac{g}{2} - g \cdot \cos^2 \alpha = \boxed{0,14g}$$

Условие

лучи (2)

Рассмотрим с.о. клина:  
на брусок действует ускорение  $-\vec{a}$ , а клин покоится



$$t_0 = \sqrt{\frac{2H}{\sin^2 \alpha (g \cdot \sin \alpha - a \cdot \cos \alpha)}}$$

$$a_x = a - a_1 \cdot \cos \alpha$$

$$S = \frac{a_x t_0^2}{2} \Rightarrow$$

$$t_0 = \sqrt{\frac{2S}{a_x}}$$

$$\textcircled{3} \quad t_0 = \sqrt{\frac{2H}{g \cdot \frac{4}{5} \left( \frac{4}{5} \cdot 0,14 \cdot \frac{5}{5} \right)}} = \sqrt{\frac{2H}{0,096g}}$$

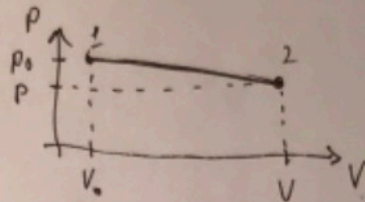
Ответ: 1)  $\sqrt{\frac{3,125H}{g}}$  2) 0,14g 3)  $\sqrt{\frac{2H}{0,096g}}$

N5

$$p = 0,99 p_0$$

$$V = 1,02 V_0$$

лест (3)



$$pV = \nu RT$$

$$p_0 V_0 = \nu R \Delta T$$

$$T = T_0 \cdot \frac{pV}{p_0 V_0}$$

$$T = T_0 \cdot \frac{0,99 p_0 \cdot 1,02 V_0}{p_0 \cdot V_0} \approx 1,01 T_0$$

$$\Delta T = T - T_0 = 1,01 T_0 - T_0 = 0,01 T_0$$

(1)

T увеличилась на 1%

(2)

$$Q = \Delta U + A$$

$$\Delta U = \frac{3}{2} \Delta(pV)$$

$$pV = \nu RT$$

A можно найти как площадь под графиком.

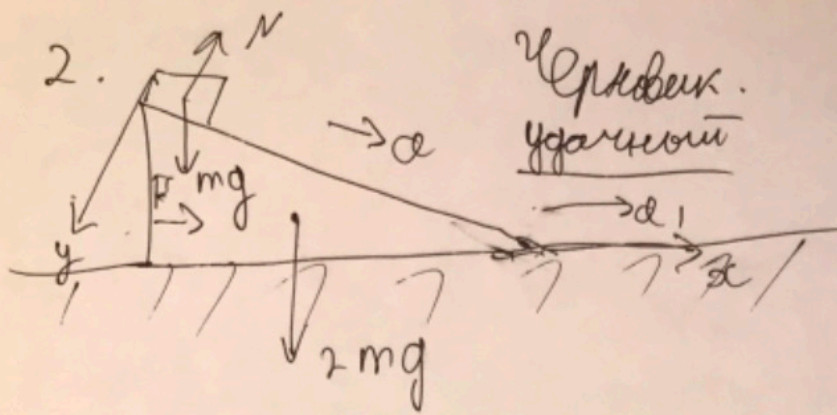
$$A = \frac{p_0 + 0,99 p_0}{2} \cdot (1,02 V_0 - V_0) = 0,0199 p_0 V_0$$

$$\Delta U = \frac{3}{2} (1,02 V_0 \cdot 0,99 p_0 - p_0 V_0) = 0,0147 p_0 V_0$$

$$\frac{Q}{\Delta U} = \frac{(0,0147 + 0,0199) p_0 V_0}{0,0147 p_0 V_0} \approx 2,35$$

Ответ: 1) увеличилась на 1%

2) 2,35



Ускорен.  
управлени

$$\vec{m}\vec{a} = m\vec{g} + \vec{N}$$

$$\text{ог} : N = mg \cdot \cos \alpha$$

$$N = P \text{ (по III з.П)}$$

$$2m\vec{a}_1 = \vec{F} + 2m\vec{g} + \vec{N}_1 + \vec{R}$$

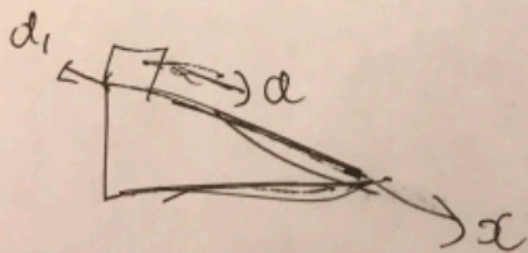
$$\text{ox} : 2ma_1 = mg - p \cdot \cos \alpha$$

$$\frac{1}{2} - \frac{9}{25} = \frac{9,14}{50}$$

$$2) a_1 = \frac{g}{2} - g \cdot \cos^2 \alpha = (g \cdot 0,14)$$

3) C.O.k. Kинетика:

могва у спречна -  $\vec{a}$ , а кинк постоумца



$$ax = d - d_1 \cdot \cos \alpha$$

$$s = \frac{ax \cdot t_0^2}{2}$$

$$t_0 = \sqrt{\frac{2s}{ax}} =$$

$$= \sqrt{\frac{2H}{\sin \alpha (g \cdot \sin \alpha - g \cdot \alpha H \cdot \cos \alpha)}}$$

$$= \sqrt{\frac{2H}{g \cdot \frac{7}{5} \left( \frac{4}{5} \cdot 0,14 \cdot \frac{3}{5} \right)}}$$

$$1) p = 0,99 p_0$$

$$V = 1,02 V_0$$

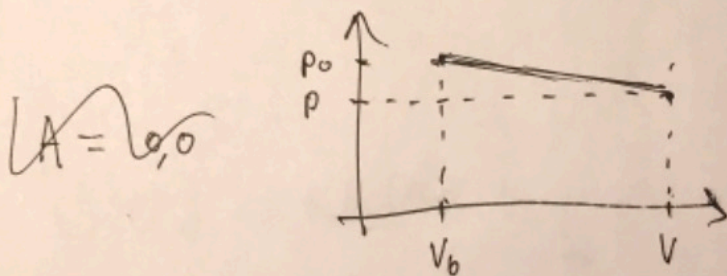
$$\begin{cases} pV = \nu R T \\ p_0 V_0 = \nu R T_0 \end{cases}$$

Чертковский  
ударный

$$T = T_0 \cdot \frac{pV}{p_0 V_0} = 1,01 T_0$$

$T$  уб на 1%

$$2) \Delta U = \frac{3}{2} \Delta pV$$



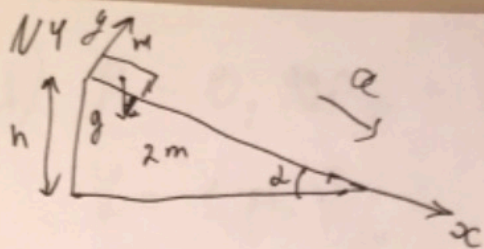
$$A = \frac{p_0 + 0,99 p_0}{2} \cdot 0,02 V_0 = \underline{0,0199 p_0 V_0}$$

$$\Delta U = \frac{3}{2} (p_0 V_0 - 0,99 p_0 \cdot 1,02 V_0) = \underline{0,0147 p_0 V_0}$$

$$Q = \Delta U + A$$

$$\frac{Q}{\Delta U} = \frac{\Delta U + A}{\Delta U} = \frac{(0,0147 + 0,0199) p_0 V_0}{0,0147 p_0 V_0} =$$

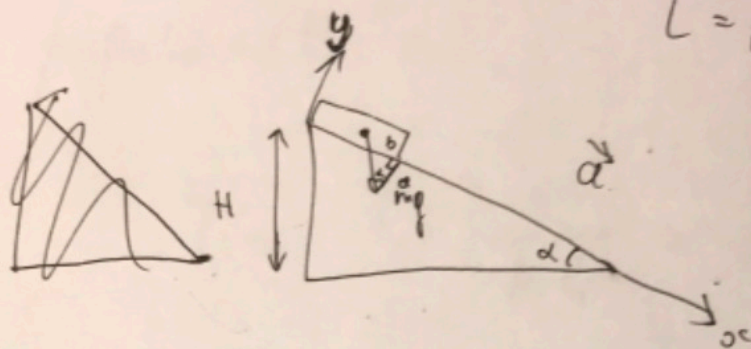




$$F = mg$$

$$\cos \alpha = \frac{3}{5}$$

$$\sin \alpha = \frac{4}{5}$$



$$L = \frac{5}{4} h$$

$$mg \cdot \sin \alpha = ma$$

$$\sin \alpha = \frac{b}{mg} \times \frac{4}{5}$$

$$a = g \cdot \sin \alpha$$

$$5b = 4mg$$

$$5ma = 4mg$$

$$a = \frac{4}{5}g$$

$$L = \frac{at^2}{2}$$

$$\frac{5}{4}h = \frac{g \cdot \sin \alpha \cdot t^2}{2}$$

$$2,5h = g \cdot \sin \alpha \cdot t^2$$

1

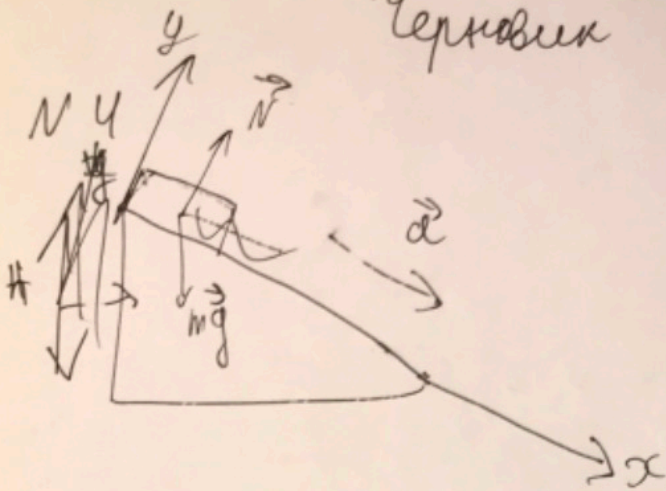
$$t = \sqrt{\frac{2,5h \cdot \cdot}{g \cdot \sin \alpha}}$$

$$= \sqrt{\frac{2,5h}{g \cdot \frac{4}{5}}}$$

$$= \sqrt{\frac{2,5 \cdot \frac{5}{4}h}{g}}$$

$$= \sqrt{\frac{3,125h}{g}}$$

Через



$$m\vec{g} + \vec{N} = m\vec{a}$$

$$\text{or: } m\vec{a} = m\vec{g} \cdot \sin \alpha$$

$$a = g \cdot \sin \alpha$$

$$S = \frac{at^2}{2}$$

$$\frac{H}{S} = \sin \alpha$$

$$S = \frac{H}{\sin \alpha} = \frac{H}{\frac{4}{5}} = \frac{5}{4} H$$

$$\sin^2 \alpha + \cos^2 \alpha = 1$$

$$\frac{9}{25} + \sin^2 \alpha = 1$$

$$\sin^2 \alpha = \frac{16}{25}$$

$$\sin \alpha = \frac{4}{5}$$

$$\frac{H}{\sin \alpha} = \frac{g \cdot \sin \alpha \cdot t^2}{2}$$

$$\frac{5}{4} H = \frac{g \cdot \sin \alpha \cdot t^2}{2}$$

$$\frac{10}{4} H = g \cdot \sin \alpha \cdot t^2$$

$$t^2 = \frac{10 \cdot H}{4 \cdot g \cdot \sin \alpha}$$

$$t = \sqrt{\frac{10H}{4 \cdot g \cdot \sin \alpha}}$$

$$= \sqrt{\frac{2,5H}{g \cdot \sin \alpha}}$$

gH

$$\frac{5}{4} H = \frac{g \cdot \sin \alpha \cdot t^2}{2}$$

$$\frac{10}{4} H = g \cdot \sin \alpha \cdot t^2$$

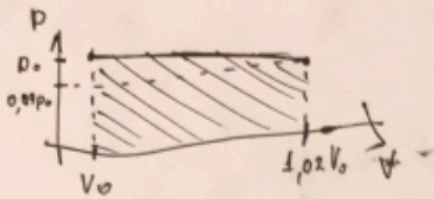
$$\frac{2,5H}{g \cdot \sin \alpha} = t^2$$

$$t = \sqrt{\frac{2,5H}{g \cdot \sin \alpha}}$$

1

$$p_1 = 0,99 p_0$$

$$V_1 = 1,02 V_0$$



$$\begin{cases} p_0 V_0 = \nu R T_0 \\ p_1 V_1 = \nu R T_1 \end{cases}$$

$$\therefore \begin{cases} p_0 V_0 = \nu R T_0 \\ 1,001 p_0 V_0 = \nu R T_1 \end{cases}$$

$$\nu R \Delta T = 0,001 p_0 V_0$$

$$\begin{aligned} A_2 &= (1,02 - 1) \cdot V_0 \cdot \frac{(1 - 0,99) \cdot p_0}{2} \\ &= p_0 V_0 \cdot 0,02 \cdot 0,05 = \underline{0,001 p_0 V_0} \end{aligned}$$

$$A_{\text{раб } 2} = \underline{-0,001 p_0 V_0}$$

$$\frac{T_1}{T_0} = 1,001$$

$$T_1 = 1,001 \cdot T_0 =$$

~~#~~

$$\Delta T = 0,1\%$$

$$\Delta U = \frac{3}{2} \nu R \Delta T - A = 0,0015 p_0 V_0 - 0,001 p_0 V_0 = \underline{0,0005 p_0 V_0}$$

$$Q = \Delta U - A = 0,0005 p_0 V_0 - 0,001 p_0 V_0 \stackrel{(\text{отпуск})}{=} \underline{0,0005 p_0 V_0}$$

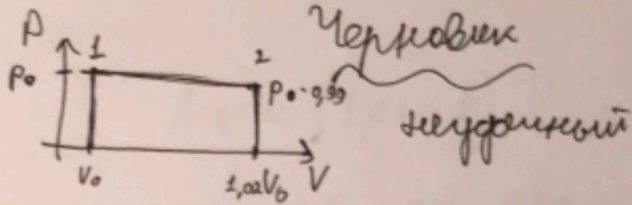
$$\frac{Q}{\Delta U} = -1$$

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негодный.

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$$p_1 = 0,99 p_0$$

$$V_1 = 1,02 V_0$$



$$A_2 = (1,02 - 1) \cdot V_0 \cdot \frac{(p_0 - 0,99 p_0)}{2} = 0,2 V_0 \cdot 0,05 p_0 =$$

$$= 0,01 p_0 V_0$$

$$A_{\text{изг.}} = -0,01 p_0 V_0$$

$$\begin{cases} p_0 V_0 = \nu R T_0 \\ p_1 V_1 = \nu R T_1 \end{cases}$$

$$p_0 V_0 = \nu R T_0$$

$$p_1 V_1 = \nu R T_1$$

$$p_0 V_0 = \nu R T_0$$

$$1,001 p_0 V_0 = \nu R T_1$$

$$p_0 V_0 \cdot (1,001 - 1) = \nu R \Delta T$$

$$0,001 p_0 V_0 = \nu R \Delta T$$

$$\Delta T = \frac{0,001 p_0 V_0}{\nu R}$$

$$\Delta U = \frac{3}{2} \nu R \Delta T - 0,01 p_0 V_0 = \frac{3}{2} \cdot 0,001 - 0,01 =$$

$$= \frac{0,003}{2} - 0,01 = 0,0015 - 0,01 = -0,0085 p_0 V_0$$

$$Q = \Delta U + A = -0,0085 - 0,01 = -0,0185 p_0 V_0$$

$$\frac{Q}{\Delta U} = \frac{-0,0185 p_0 V_0}{-0,0085 p_0 V_0} = 2,176$$

$$\therefore \begin{cases} p_0 V_0 = \nu R T_0 \\ 1,001 p_0 V_0 = \nu R T_1 \end{cases}$$

$$\frac{T_1}{T_0} = 1,001$$

$$T_1 = 1,001 T_0$$

$T_1$  увеличилась на 0,1%

$$\Delta U = \frac{3}{2} \nu R \Delta T + A_{\text{над } z.}$$

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