

# Часть 1

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

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ID профиля: **832066**

Вариант 1

N3

Dani:

$$t = 27^{\circ}\text{C}$$

$$n = 3.1$$

$$M_0 \quad M = 18 \frac{\text{L}}{\text{mol}}$$

$$k_1 = \frac{V_R}{V_n} = 3.5$$

$$k_2 = \frac{P_n}{P_0} = 1.8$$

$$P_{n.11} = 0.5 \cdot 10^5 \text{ Pa}$$

$$P_0 = ? \quad k_k = ?$$

$$P V = n R T$$

$$P_0 V_0 = \frac{3}{18} R T$$

$$V_0 = 3.5 V_k$$

$$P_k = 1.8 P_0$$

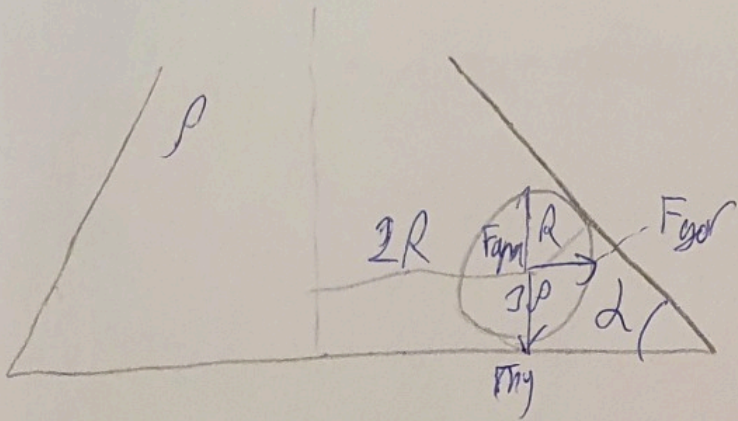
$$P_0 V_0 = P_k V_k$$

$$(3.5 V_k) \left( \frac{P_k}{1.8} \right) = \frac{3.5}{1.8} V_k P_k$$

$$P_0 = \frac{P_{n.11}}{1.8} = \frac{0.5 \cdot 10^5}{1.8} \text{ Pa} \approx 0.28 \cdot 10^5 \text{ Pa}$$

$$\text{Answer: } 0.28 \cdot 10^5 \text{ Pa}$$

N 2



$$N_1 = mg - F_{agn}$$

$$mg = 3\rho \cdot Vg$$

$$F_{agn} = \rho Vg$$

$$N_1 = 2\rho Vg = \boxed{2\rho \frac{4}{3} \pi R^3 g}$$

Jika sumbu  
Fagn berimpak dengan  
m. k sh na konyan  
wpa mns.

$$\text{OK: } F_{agd} - p_2 \sin \alpha = 0$$

$$\text{OK: } F_{agn} = + N_2 - mg - p_2 \cos \alpha = 0$$

$$F_{agd} = p_2 \sin \alpha$$

$$p_2 = \frac{F_{agd}}{\sin \alpha}$$

$$N_2 = mg + \frac{F_{agd}}{\sin \alpha} \cos \alpha - F_{agn}$$

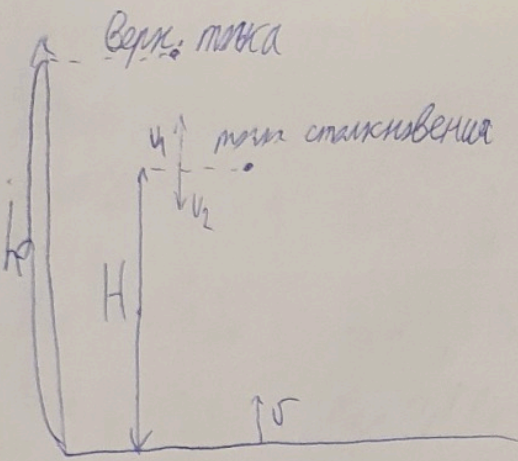
$$N_2 = mg \left( 1 + \frac{1}{\tan \alpha} \right) - \rho Vg$$

$$N_2 = 3\rho Vg \left( 1 + \frac{1}{\tan \alpha} \frac{w^2 R}{g} \right) - \rho Vg$$

$$N_2 = 3g \frac{4}{3} \pi R^3 \rho \left( 1 + \frac{w^2 R}{g} \right) - \rho \frac{4}{3} \pi R^3 g = \boxed{\rho \frac{4}{3} \pi R^3 g \left( 2 + \frac{3w^2 R}{g} \right)}$$

$$21206131 (U832066 M1182190) \text{ ; } N_2 = \rho \frac{4}{3} \pi R^3 g \left( 2 + \frac{3w^2 R}{g} \right)$$

Ombem:  $N_1 = 2\rho \frac{4}{3} \pi R^3 g$



N1 ЗСЭ!

$$\frac{mv^2}{2} = mgh = mgH + \frac{mu^2}{2}$$

$$mgh = mgH + \frac{mu^2}{2}$$

$$u = \sqrt{2g(h-H)}$$

$v$  - нач. скорость  
 $u, u_2$  - скорость в момент столкновения  
 $u_1 = u_2 = u$        $v_1 = gt$        $v_2 = v - gt$

$$u_1 = u_2 \Rightarrow gt = v - gt \Rightarrow v = 2gt \Rightarrow t = \frac{v}{2g}$$

$$u = gt = g \frac{v}{2g} = \frac{v}{2}$$

$$m \frac{v^2}{2} = mgH + m \frac{u^2}{2} \Rightarrow \frac{m}{2} (v^2 - u^2) = mgH$$

$$v^2 - \frac{v^2}{4} = 2gH$$

$$\frac{3}{4} v^2 = 2gH$$

$$v = \sqrt{\frac{8}{3} gH} = 2\sqrt{\frac{2}{3} gH}$$

$$s = h - H = \frac{5}{3} H$$

$$s = h - H = \frac{5}{3} H$$

$$t = \frac{2\sqrt{\frac{2}{3} gH}}{2g} = \sqrt{\frac{2}{3} \frac{H}{g}}$$

$$h = H + \frac{2}{3} H = \frac{5}{3} H$$

$$s = h + s = \frac{5}{3} H + \frac{2}{3} H = \frac{7}{3} H$$

- 1) Ответ:  $t = \sqrt{\frac{2}{3} \frac{H}{g}}$
- 2) Ответ:  $v_{\text{нач}} = 2\sqrt{\frac{2}{3} gH}$
- 3) Ответ:  $s_0 = \frac{7}{3} H$

# Часть 2

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

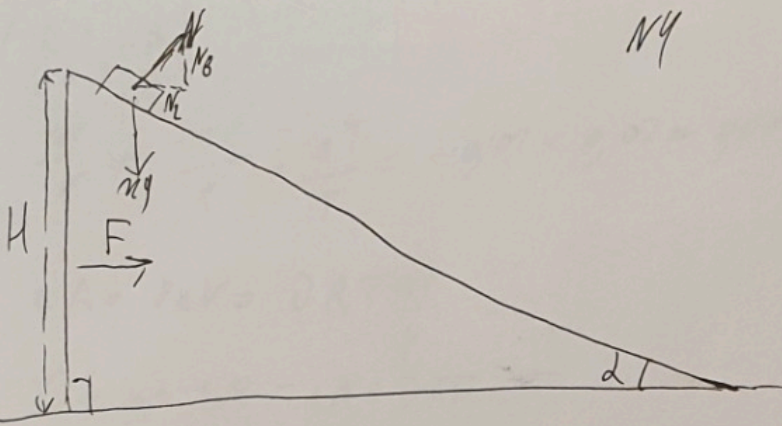
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Вариант 1

Membran

NY



$$a_w = g \sin \alpha$$

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

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

$$a_{\text{kurva}} = \frac{F}{m} = \frac{2mg}{4m} = \frac{1}{2}g = a_{\text{kurva}}$$

$$-\frac{1}{2}g \cos \alpha + g \sin \alpha = a_w$$

$$a_w = g(\sin \alpha - \frac{1}{2} \cos \alpha)$$

$$\tau = \frac{2H}{a_w \sin \alpha} = \frac{2H}{g(\sin^2 \alpha - \frac{1}{2} \cos \alpha \sin \alpha)}$$

Orbemi:  $t = \frac{2H}{g \sin^2 \alpha}$ ;  $a_{\text{kurva}} = \frac{1}{2}g$ ;  $\tau = \frac{2H}{g(\sin^2 \alpha - \frac{1}{2} \cos \alpha \sin \alpha)}$

①

$$PV = JRT$$

$$\frac{\Delta V}{V} + \frac{\Delta P}{P} = \frac{\Delta T}{T} = -0,01 + 0,02 = 0,01 = 1\%$$

$$\Delta A = P \Delta V = JRT \frac{\Delta V}{V}$$

$$Q = \Delta A + \Delta K = \Delta A + JRT$$

$$\frac{Q}{A} = \frac{Q}{\Delta A} = \frac{\Delta A + \Delta K}{\Delta A} = 1 + \frac{\Delta K}{\Delta A} = 1 + \frac{\frac{3}{2} J R \Delta T}{J R T} \frac{V}{\Delta V} = 1 + \frac{3}{2} \frac{\Delta T}{T} \frac{V}{\Delta V} = 1 + \frac{0,015}{-0,01}$$

$$\frac{3}{2} = 1 - 1,5 = -0,5$$

Answer: 1) 1% ; 2)  $\frac{Q}{A} = -0,5$

2