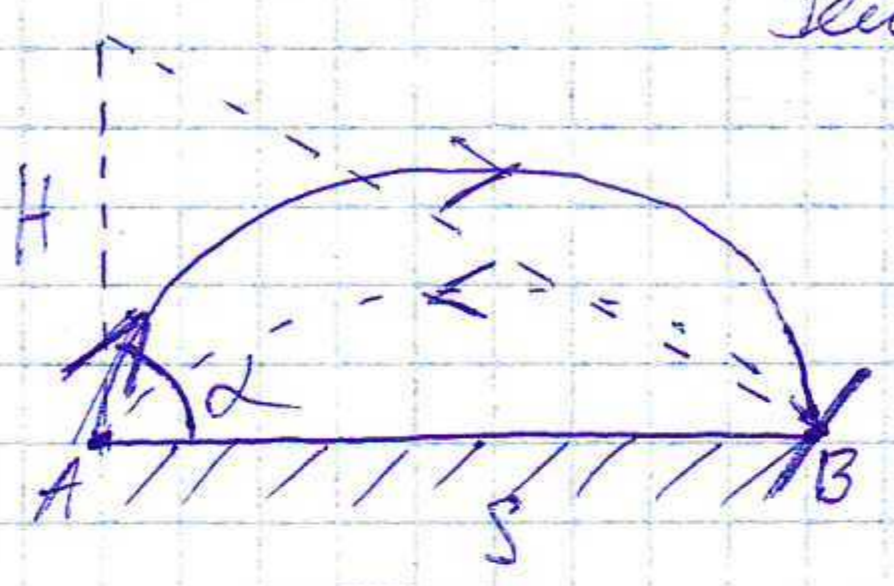


11

Дано:

$t_{AB} = \sqrt{3}$ сек



Решение:

на пути BA
высота уменьшается
в 3 раза

$\alpha = ?$

$$t_{AB} = \sqrt{\frac{2H}{g}} \quad t_{BA} = \sqrt{\frac{2H}{g}} \quad t_{BA} = \frac{\sqrt{\frac{2H}{g}}}{\sqrt{3}}$$

$$H = \frac{gt^2}{2} \quad S = v_0 t + \frac{gt^2}{2} \quad S = v_0 t + H$$

$$\tan \alpha = \frac{t_{AB}}{t_{BA}} = \frac{\sqrt{\frac{2H}{g}}}{\frac{\sqrt{\frac{2H}{g}}}{\sqrt{3}}} = \sqrt{3} \quad \tan \alpha = \sqrt{3} = 30^\circ$$

$\tan \alpha = 30^\circ$

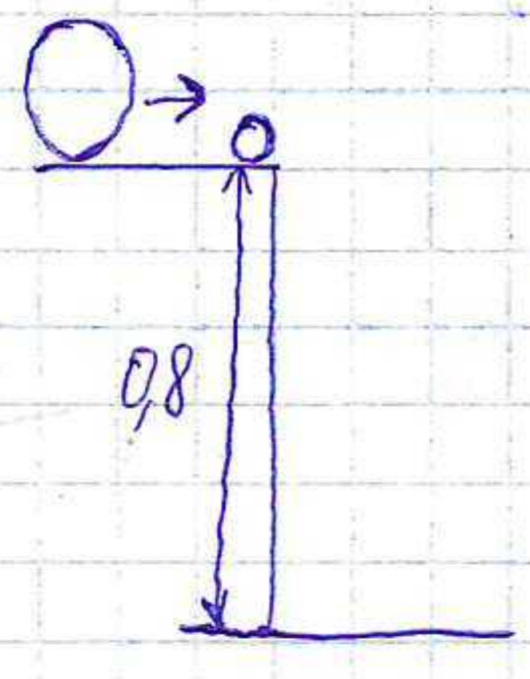
Ответ: 30°

12

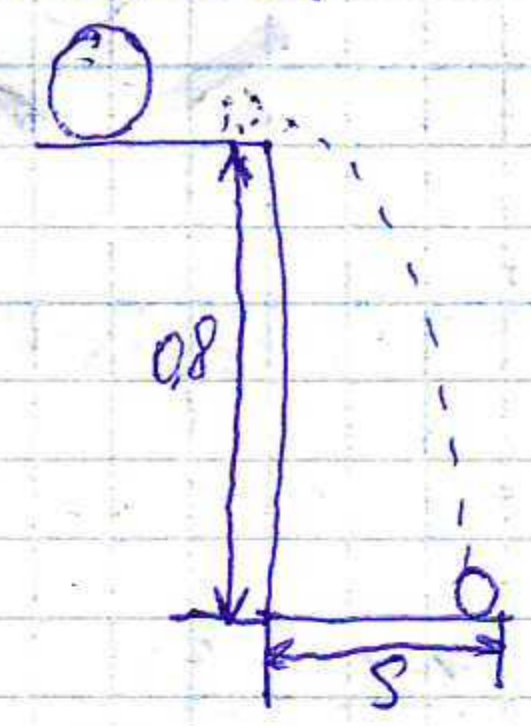
Дано:

$h = 0.8$ м
 $M = m$
 $v_1 = 10$ м/с
 $g = 10$ м/с²

$S = ?$



Решение:



$$\vec{P} = \vec{P}_1 + \vec{P}_2$$

$$Mv_1 + 0 = 0 + mv_1$$

т.к. масса много больше шарика

11-12

$$s = v_0 t + \frac{g t^2}{2} \quad t = \sqrt{\frac{2h}{g}}$$

$$s = v_0 \sqrt{\frac{2h}{g}} + \frac{g \cdot \frac{2h}{g}}{2}$$

$$s = v_0 \sqrt{\frac{2h}{g}} + h$$

$$s = 10 \cdot \sqrt{\frac{2 \cdot 0,8}{10}} + 0,8$$

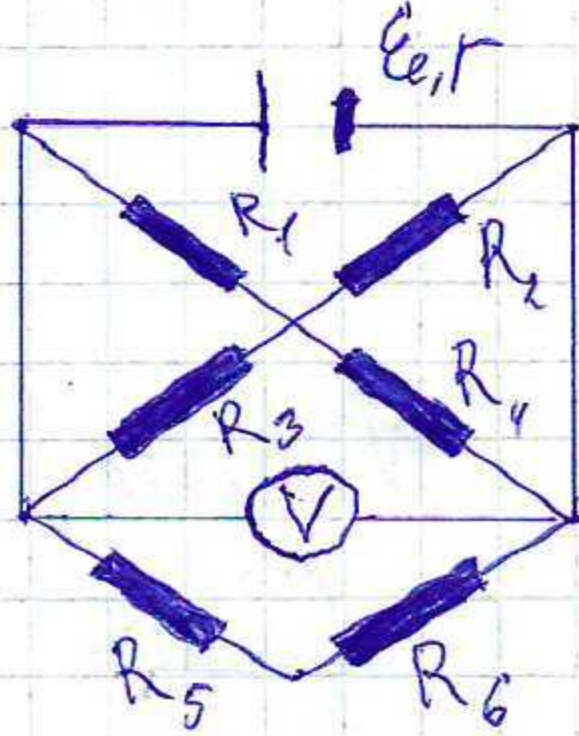
$$s = 4,8 \text{ m}$$

Jawab: 4,8 m.

Dik: ≈ 3

$E_e = 6 \text{ B}$
 $r = \frac{2}{3} \text{ Ohm}$
 $R = 2 \text{ Ohm}$

U = ?



Jawab:

$$I = \frac{E_e}{r + R}$$

$$U = I \cdot R$$

$$R_{1-4} = R_1 + R_2 + R_3 + R_4 = 8 \text{ Ohm}$$

$$R_{5-6} = R_5 + R_6 = 4 \text{ Ohm}$$

$$R_{\text{total}} = \frac{R_{1-4} \cdot R_{5-6}}{R_{1-4} + R_{5-6}}$$

$$R_{\text{total}} = \frac{8 \cdot 4}{8 + 4} = \frac{32}{12}$$

$$I = \frac{6}{\frac{2}{3} + \frac{32}{12}} = 1,8A$$

11-712

$$U = 1,8 \cdot \frac{32}{12} = 4,8B.$$

Jawab: 4,8B.

nH

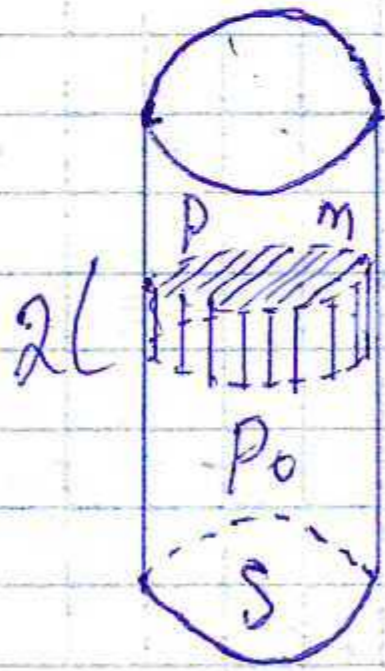
Dikno:

$$2L \quad g = 10 \text{ m/s}^2$$

$$P_0 \quad p = 10^5 \text{ Pa}$$

$$T = \text{const}$$

$$T = ?$$



Ditanyakan:

$$T = 2\pi \sqrt{\frac{L}{g}}$$

$$S_0 = \pi r^2 \quad r = \sqrt{\frac{S}{\pi}}$$

$$V = \pi r^2 H$$

$$T = \text{const}$$

$$P_1 V_1 = P_2 V_2$$

$$P V = P_0 V$$

$$P V = 10^5 \cdot \pi \cdot \frac{S}{\pi} \cdot 2L = 20^5 S L$$

$$A = F S \quad P V = F S \quad F = \frac{P V}{S}$$

$$F = \frac{20^5 S L}{S} = 20^5 L \quad \rho g = 20^5 \text{ L}$$

$$g = \frac{20^5 L}{m}$$

$$T = 2\pi \sqrt{\frac{L}{\frac{20^5 L}{m}}}$$

$$T = 2\pi \sqrt{\frac{m}{20^5}} \text{ c.}$$

Jawab: $T = 2\pi \sqrt{\frac{m}{20^5}} \text{ c.}$

Дано:

$V_1 = 5 \text{ л}$

$V_2 = 10 \text{ л}$

$V_3 = 15 \text{ л}$

$p_1 = 3,17 \cdot 10^5 \text{ Па}$

$p_3 = 0,51 \cdot 10^5 \text{ Па}$

определить η

или:

$0,005 \text{ м}^3$

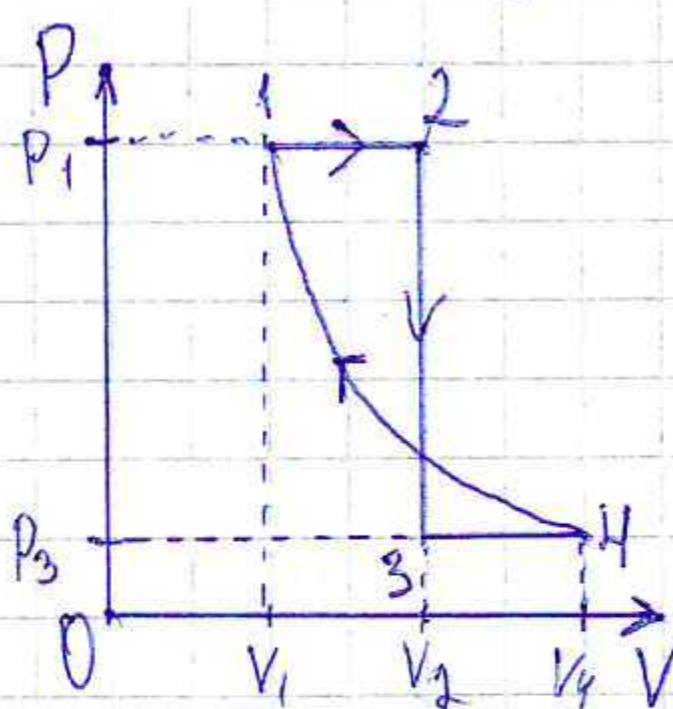
$0,01 \text{ м}^3$

$0,015 \text{ м}^3$

$3,17 \cdot 10^5 \text{ Па}$

$5,1 \cdot 10^4 \text{ Па}$

Решение:



$1 \rightarrow 2 \quad 2 \rightarrow 3 \quad 3 \rightarrow 4 \quad 4 \rightarrow 1$

$1-2 \quad p_1 = \text{const} \quad A = p_1 \Delta V \quad A = 3,17 \cdot 10^5 \cdot (0,01 - 0,005) = 1585 \text{ Дж.}$

$2-3 \quad V = \text{const} \quad A = 0 \quad U = Q \quad U = \frac{2}{3} \Delta p V = \frac{2 \cdot 266000 \cdot 0,01}{3} = 4773 \text{ Дж.}$

$3-4 \quad p_3 = \text{const} \quad A = p_3 \Delta V \quad A = 51000 (0,015 - 0,01) = 255 \text{ Дж.}$

$4-1 \quad \text{адиабатный процесс} \quad Q = 0$

$\eta = \frac{T_4 - T_1}{T_4} \cdot 100\%$

$\eta = \frac{Q_4 - Q_1}{Q_4} \cdot 100\%$

$Q_{12} = U + A = \frac{2}{3} p_1 \Delta V + A_{12} = 1056 + 1585 = 2642 \text{ Дж.}$

$Q_{34} = U + A = \frac{2}{3} p_3 \Delta V + A_{34} = 170 + 255 = 425 \text{ Дж.}$

$Q_{23} = Q_1$

$Q_{12} \text{ и } Q_{34} = H.$

$\eta = \frac{Q_4 - Q_1}{Q_4} \cdot 100\%$

$$\eta = \frac{Q_{12} + Q_{34} - Q_{23}}{Q_{12} + Q_{34}} \cdot 100\%$$

$$\eta = \frac{3067 - 1773}{3067} \cdot 100\%$$

$$\eta \approx 42,2\%$$

Answer: 42,2%