

1. Dano:  $l$ :  $R$

$$l = 10 \mu\text{m} = 0,1 \mu\text{m}$$

$$AB = d_k = 10 \mu\text{m} = 0,1 \mu\text{m} \quad R_{\text{no}} = l = 0,1 \mu\text{m}$$

$$U_A = 1 \mu\text{V}$$

$$t = ?$$

Решение

~~$$L_{\text{exp}} = \frac{2 \pi R^2}{R} = 2 \pi R = 2 \cdot 3,14 \cdot 0,1 = 0,628 \mu\text{m}$$~~

~~$$L_{\text{exp}} = \frac{2 \pi R^2}{R} = 628 \mu\text{m}$$~~

~~$$t = \frac{L_{\text{exp}}}{v} = 628 \text{ (с)}$$~~

$$L_{\text{exp}} = 2 \pi R = 0,628 \mu\text{m}$$

$$L_k = 2 \pi R = 0,314 \mu\text{m}$$

$$dR_k = \frac{dL_k}{2} = \frac{0,1}{2} = 0,05$$

$$L = \frac{L_{\text{exp}}}{L_k} = \frac{0,628}{0,314} = 2 \text{ (погрешность)}$$

$$U_{\text{exp}} = \frac{U_A}{2} = \frac{1}{2} = 0,5 \mu\text{V} \quad - 25$$

$$t = \frac{L_{\text{exp}}}{U_{\text{exp}}} = \frac{0,628}{0,5} = 1,256 \text{ (с)} \quad - 10$$

Ответ: 1,256 с

2 Dano:

$$R_1 = 10 \text{ Ом}$$

$$R_2 = 40 \text{ Ом}$$

$$R_3 = 60 \text{ Ом}$$

$$R_4 = 40 \text{ Ом}$$

$$R_5 = 16 \text{ Ом}$$

$$R_6 = 20 \text{ Ом}$$

$$U = 8,4 \text{ В}$$

$$I_{\text{max}} = 2 \text{ А}$$

$$P_3 = ?$$

Решение.

~~$$R_{2,3} = \frac{R_2 + R_3}{R_2 \cdot R_3} = R_{2,3} = \frac{R_2 \cdot R_3}{R_2 + R_3} = \frac{40 \cdot 60}{40 + 60} = 24 \text{ (Ом)}$$~~

$$P_3 = \frac{U^2}{R} = 9 \mu\text{A} \quad R_{2,3,4} = \frac{R_{2,3} \cdot R_4}{R_{2,3} + R_4} = \frac{24 \cdot 40}{64} = 15 \text{ (Ом)} \quad - 35$$

$$R_{1,6} = \frac{R_1 \cdot R_6}{R_1 + R_6} \approx 6,7$$

$$R_{1,6,5} = R_{1,6} + R_5 = 6,7 + 16 = 22,7 \text{ (Ом)}$$

~~$$R_{\text{total}} = R_{2,3,4} + R_{1,6,5} = 15 + 22,7 =$$~~

$$= 37,67 \text{ (Ом)}$$

$$R_{\text{var}} = \frac{R \cdot R_{\text{total}}}{R + R_{\text{total}}} \approx 1,9 \text{ (Ом)}$$

$$I = \frac{U}{R_{\text{var}}} \approx 4,4 \text{ (А)}, \quad I_3 = \frac{U}{R_3} = \frac{8,4}{60} \approx 0,14 \text{ (А)}$$

$$P_3 = U \cdot I_3 = 8,4 \cdot 0,14 \approx 1,176 \text{ (Вт)} \quad - 1$$

Объем: 12,6 БТ.

3 Дано:

$$\rho_c = 520 \frac{\text{кг}}{\text{м}^3}$$

$$l = 0,1 \text{ м}$$

$$\rho_b = 1000 \frac{\text{кг}}{\text{м}^3}$$

$$h_n = ?$$

Решение

$$F_m = F_{\text{выт}} - 25 \cdot \kappa = \frac{F}{5}$$

$$m_T g = \rho_b g h_n - 25$$

$$h_n = \frac{m_T g}{\rho_b g} = \frac{\rho_c \cdot l \cdot g}{\rho_b g} = 0,052$$

Объем: 0,052 м.

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4 Дано:

$$t_0 = 10^\circ \text{C}$$

$$t = 100^\circ \text{C}$$

$$t = 10 \text{ мин.}$$

$$c_0 = 4200 \frac{\text{Дж}}{\text{кг} \cdot ^\circ \text{C}}$$

$$L = 2,3 \cdot 10^6 \frac{\text{Дж}}{\text{кг}}$$

Решение

$$Q_1 = m c \Delta t = 378000 \text{ Дж}$$

$$Q_2 = m L = 23000000 \text{ Дж}$$

$$Q_3 = P t = Q_2 = P t$$

$$Q_1 = Q_2 \cdot \frac{25}{100}, m c \Delta t = P t \Rightarrow P = \frac{378000 \text{ Дж}}{600} = 630 \text{ Вт}$$



$$t - ? \quad \left. \begin{array}{l} Q_3 = mL - \text{red } Q_4 = Pt - \text{red } Q_3 = Q_4; mL = Pt \Rightarrow \\ Q \Rightarrow t = \frac{mL}{P} = \frac{m \cdot 23000000}{63000} = 3650,8(\text{с}) = \\ \approx \underline{1(\text{г})} \end{array} \right\} \text{ Ответ: } \approx 1 \text{ г.} - 2 \quad 105.$$

5 Дано:

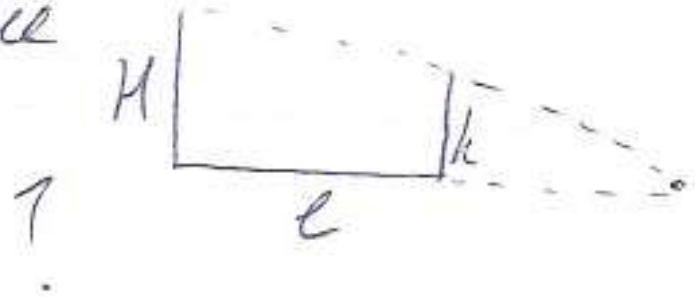
$$h_{\text{оп}} = H$$

$$\frac{S_{\text{ант. гора}}}{S_{\text{осн}}} = k$$

$$h_{\text{г}} = h$$

$$V_{\text{г}} = ?$$

Решение



ответ: 255.