

Величины, характеризующие колебания

Физика 9 класс

15.12.2021 г.

П-1720, 1728, 1729

П-1720 | CU

$$T_c = 5 \mu\text{с} = 5 \cdot 10^{-3} \text{с} \quad N_c = \frac{t}{T_c} = \frac{60 \text{сек}}{5 \cdot 10^{-3} \text{сек}} = 12 \cdot 10^3$$
$$V_{\mu} = 600 \text{Тг}(\text{с}^{-1}) \quad N_{\mu} = V_{\mu} \cdot t = 600 \text{с}^{-1} \cdot 60 \text{сек} = 36 \cdot 10^3$$
$$t = 1 \text{мин} = 60 \text{сек} \quad \Delta N = N_{\mu} - N_c = 36 \cdot 10^3 - 12 \cdot 10^3 = 24 \cdot 10^3$$

$N_c - ?$ $N_{\mu} - ?$ $\Delta N - ?$

П-1728 | (уєткo)

$$T = 0,02 \text{с} \quad \underline{V} = \frac{1}{T} = \frac{100}{0,02 \text{с}} = \underline{50 \text{с}^{-1}(\text{Тгг})}$$

$V - ?$

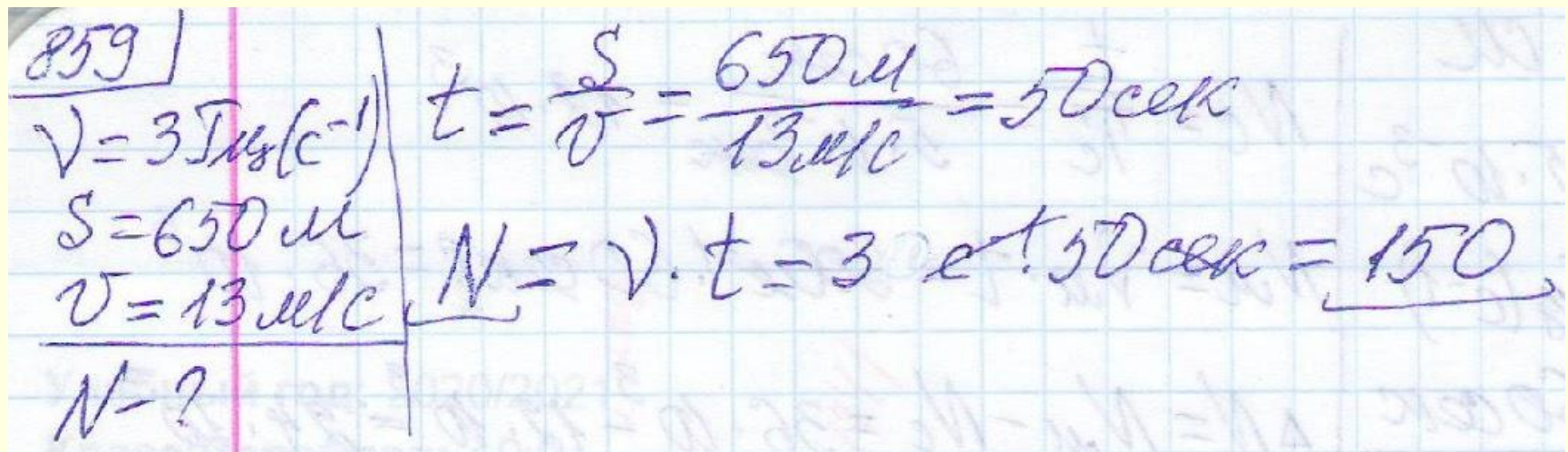
П-1729 | CU

$$N = 1200 \quad \underline{V} = \frac{N}{t} = \frac{1200}{300 \text{сек}} = \underline{4 \text{с}^{-1}(\text{Тгг})}$$
$$t = 5 \text{мин} = 300 \text{сек}$$

$V - ?$

859

859. Частота колебаний крыльев вороны в полете равна в среднем 3 Гц. Сколько взмахов крыльями сделает ворона, пролетев путь 650 м со скоростью 13 м/с?



Handwritten solution on grid paper:

859	$t = \frac{S}{v} = \frac{650 \text{ м}}{13 \text{ м/с}} = 50 \text{ сек}$
$v = 3 \text{ Гц} (\text{с}^{-1})$	$N = v \cdot t = 3 \cdot 50 \text{ сек} = \underline{150}$
$S = 650 \text{ м}$	
$v = 13 \text{ м/с}$	
$N = ?$	

877, П-1740

- 877. Определить частоту колебаний груза массой 50г, прикрепленного к пружине жёсткостью 0,49 Н/м.

Handwritten solution for problem 877 on grid paper. The text is written in blue ink. It starts with the number '877' in a box. Below it, the mass $m = 50 \text{ г} = 0,05 \text{ кг}$ and the spring constant $k = 0,49 \text{ Н/м}$ are listed. The question 'V-?' is written below. To the right, the formulas for frequency $\nu = \frac{1}{T}$ and period $T = 2\pi \sqrt{\frac{m}{k}}$ are shown. These are combined into $\nu = \frac{1}{2\pi \sqrt{\frac{m}{k}}} = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$. The final calculation is $\nu = \frac{1}{2 \cdot 3,14} \sqrt{\frac{0,49}{0,05}} \approx 0,5 \text{ Гц}$.

$$\begin{array}{l} \boxed{877} \\ m = 50 \text{ г} = 0,05 \text{ кг} \\ k = 0,49 \text{ Н/м} \\ \hline V - ? \end{array} \left. \begin{array}{l} \nu = \frac{1}{T} \\ T = 2\pi \sqrt{\frac{m}{k}} \end{array} \right\} \nu = \frac{1}{2\pi \sqrt{\frac{m}{k}}} = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$
$$\nu = \frac{1}{2 \cdot 3,14} \sqrt{\frac{0,49}{0,05}} \approx 0,5 \text{ Гц}$$

Handwritten solution for problem П-1740 on grid paper. The text is written in blue ink. It starts with 'П-1740' in a box. Below it, the period $T = 1 \text{ с}$ and the acceleration due to gravity $g = 9,81 \text{ м/с}^2$ are listed. The question 'l-?' is written below. To the right, the formula for the period of a simple pendulum $T = 2\pi \sqrt{\frac{l}{g}}$ is shown, which is rearranged to $T^2 = 4\pi^2 \frac{l}{g}$. The final calculation is $l = \frac{g T^2}{4\pi^2} = \frac{9,81 \cdot 1^2}{4 \cdot 3,14^2} \approx 0,25 \text{ м} = 25 \text{ см}$.

$$\begin{array}{l} \boxed{\text{П-1740}} \\ T = 1 \text{ с} \\ g = 9,81 \text{ м/с}^2 \\ \hline l - ? \end{array} \left. \begin{array}{l} \text{из: } T = 2\pi \sqrt{\frac{l}{g}} \Rightarrow T^2 = 4\pi^2 \frac{l}{g} \Rightarrow \\ \Rightarrow l = \frac{g T^2}{4\pi^2} = \frac{9,81 \cdot 1^2}{4 \cdot 3,14^2} \approx 0,25 \text{ м} = 25 \text{ см} \end{array} \right.$$

Домашнее задание

- §24
- Решить задачи П-1717,1718,1719.