

Часть 1

Олимпиада: **Физика, 11 класс (1 часть)**

Шифр: **21203426**

ID профиля: **801652**

Вариант 8

Уақт
N

массалан

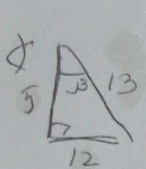
Ғаеене Hae

$$(1) \Rightarrow T = \frac{mg}{\cos \beta}$$

$$(3) \Rightarrow a = \frac{T \sin \beta}{m} \Rightarrow a = g \tan \beta$$

$$\cos \beta = \frac{5}{13}$$

$$a = 9,81 \cdot \frac{12}{5} \approx 23,5 \text{ м/с}^2$$



$$\tan \beta = \frac{12}{5}$$

$$2) (2) \Rightarrow N = \frac{mg}{\cos \alpha}$$

$$(4) \Rightarrow \frac{-5ma + N \sin \alpha - T \cos \alpha}{5m} = a_{\text{дир}} \Rightarrow$$

$$\Rightarrow -ma + \frac{mg}{5} \tan \alpha - \frac{mg}{5} \frac{\cos \alpha}{\cos \beta} = a_{\text{дир}} \Rightarrow$$

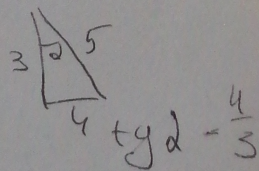
$$\Leftrightarrow a_{\text{дир}} = g \tan \alpha - g \frac{\cos \alpha}{\cos \beta} - \frac{g}{5} \tan \beta =$$

$$= 9,81 \left(\frac{4}{3} - \frac{3}{5} \cdot \frac{13}{5} - \frac{12}{25} \right) =$$

$$= 9,81 \cdot (0,54) \approx 5,3 \text{ м/с}^2$$

2.22

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



лист 3
N1

механика Физика 11кл

3)

$$H = \frac{a + 2}{2}$$

$$\sin \sqrt{c} = 0$$

$$H = \sqrt{\frac{2H}{a}} = \sqrt{\frac{2H}{g \cdot y_B}}$$

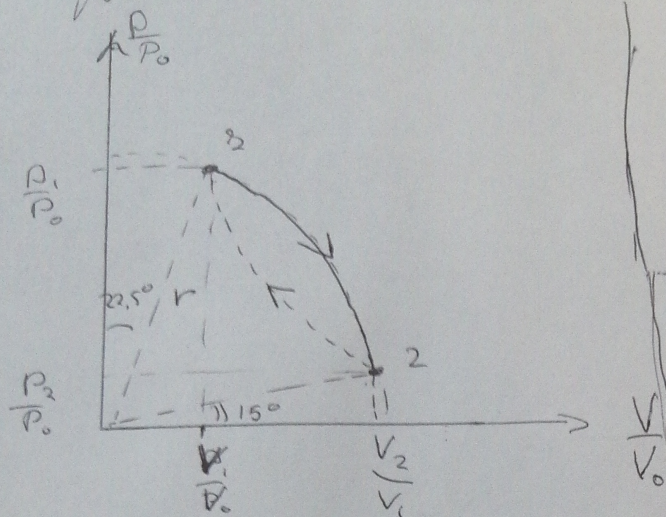
Ответ

1) 23,5 м/с²

2) 5,3 м/с²

3) $\sqrt{\frac{2H}{g \cdot y_B}}$

N₂ Абт Δ циклобул Даяуле Ике



Даяу:
 $C_V = \frac{5}{2} R$ т.е 2-х атомдас
 $Q_{2 \rightarrow 1} \rightarrow 0$

1) $\frac{T_1 - T_2}{T_2} - ?$

2) $\alpha - ?$

3) $\eta - ?$

①

1) $P_1 V_1 = \nu R T_1$

2) $P_2 V_2 = \nu R T_2$

но график

~~2) 1)~~ $\frac{P_1}{P_0} \cdot \frac{V_1}{V_0} = r \cdot \sin(22.5^\circ) \cdot \nu \sin(22.5^\circ) = \frac{T_1}{T_0}$

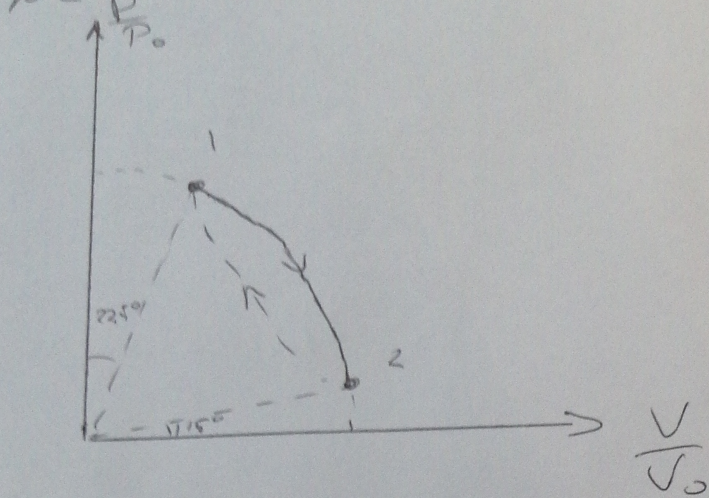
ошондо

$\frac{P_2 V_2}{P_0 V_0} = \nu^2 \cos 15^\circ \sin 15^\circ = \frac{T_2}{T_0}$

т.о.р $\frac{T_1}{T_2} = \frac{\frac{45^\circ}{2}}{\sin \frac{30^\circ}{2}} = \sqrt{2} \approx 1,4$

$\frac{T_1 - T_2}{T_2} = \frac{T_1}{T_2} - 1 = \sqrt{2} - 1 \approx 0,4$

Задача 2
 N2 молекулы



2) $c = 0$

$c = \frac{dQ}{dT} = 0 \Rightarrow$ температура минимальна
 эквивалентно

$Q^{\leftarrow} = \Delta U + A^{\rightarrow}$ - работа по расширению
 $dQ^{\leftarrow} = dU + dA^{\rightarrow}$ - теплота

Q^{\leftarrow}	ΔU	A^{\rightarrow}
$1 \rightarrow 2$	$+$	$+$
$2 \rightarrow 1$	0	$-$

в состоянии 2 $Q^{\leftarrow} = 0$ так как это и есть 2-й закон

$S_{ind} = S \sin 15^\circ = 0,26$

Задание 3 условие Рычага II кв
 №2

3) $\eta - ?$



$$\eta = \frac{A^\uparrow}{Q^\downarrow} = \frac{A_{1-2}^\uparrow - A_{2-1}^\downarrow}{Q_{1-2}^\downarrow} = \frac{A_{1-2}^\uparrow - A_{2-1}^\downarrow}{\Delta U_{1-2} + A_{1-2}^\uparrow} =$$

~~ΔU_{1-2}~~

$\Delta QV \equiv \Delta RT$

$$= \frac{A_{1-2}^\uparrow - A_{2-1}^\downarrow}{\Delta RT_{12} + A_{1-2}^\uparrow} = \frac{A_{1-2}^\uparrow - A_{2-1}^\downarrow}{2A_{1-2}^\uparrow} =$$

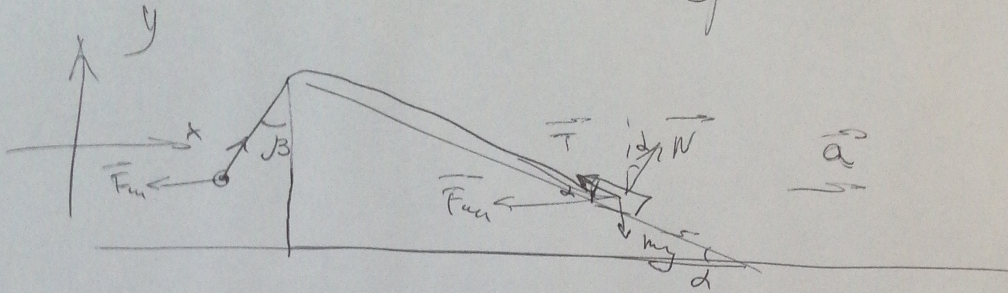
$$= \frac{1}{2} - \frac{A_{2-1}^\downarrow}{2A_{1-2}^\uparrow} = \frac{1}{2} - \frac{\Delta U_{21}}{2A_{12}^\uparrow} = \frac{1}{2} - \frac{\Delta RT_{21}}{2A_{12}^\uparrow}$$

Ответ 1) 0,4

2) $\sin \alpha = 0,26$

3) $\frac{1}{2} + \frac{\Delta U_{21}}{2A_{12}}$

Republik



~~$$T \sin \beta = m a$$~~

$$a_f = 5 \cdot \frac{4}{3} - \frac{3}{13} = \frac{20}{3} - \frac{3}{13}$$

~~$$x) T \sin \beta = m a$$~~

$$= \frac{260}{39} - \frac{4}{39}$$

$$y) T \cos \beta = m g$$

$$= \frac{260}{39} - \frac{4}{39}$$

$$= \frac{256}{39} = 6,56$$

HCO

$$a = \frac{T \sin \beta}{m} = g \tan \beta =$$

$$x) -F_{fr} a + T \sin \beta = 0$$

$$g \Rightarrow T \cos \beta = m g \quad T = \frac{m g}{\cos \beta}$$

$$x) -T \cos \alpha - 5 m a + N \sin \alpha = 0$$

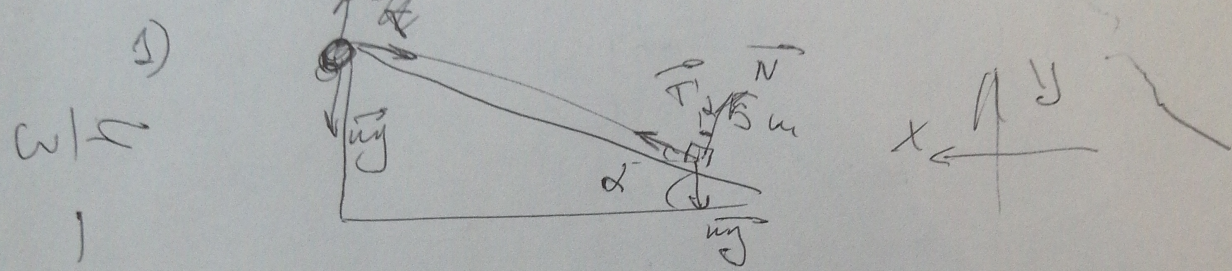
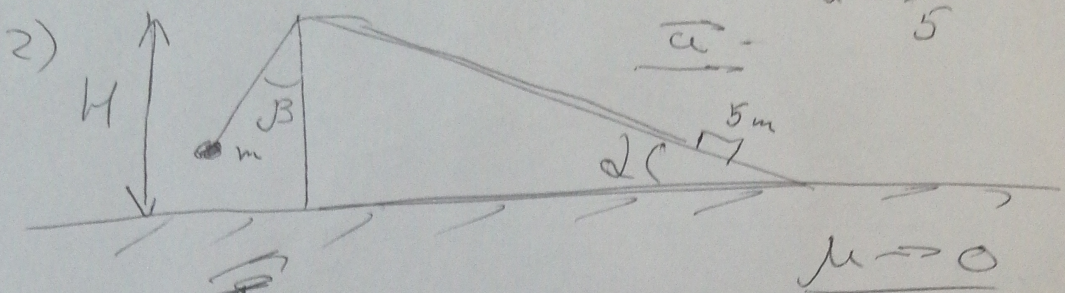
$$y) N \cos \alpha = 5 m g$$

$$T = \frac{5 m g \tan \alpha}{\cos \alpha} = 5 m a$$

$$a = \frac{5 m g \tan \alpha}{5 m} - \frac{m g}{\cos \beta} \cdot \cos \alpha$$

$$a_f = \frac{5 + g \alpha - \frac{\cos \alpha}{\cos \beta}}{5} \quad 5 m$$

republican $\tan \alpha = \frac{4}{3}$
 $\tan \beta = \frac{12}{5}$ $u = \text{const}$ $\cos \beta = \frac{5}{13}$
 $\cos \alpha = \frac{3}{5}$



$T = 5mg$ $5mg + T + N = 0$

y: $N \cos \alpha = 5mg$
 x: $T \cos \alpha = N \sin \alpha$
 $5mg \cos \alpha = N \sin \alpha$
 $5mg = N \cos \alpha$

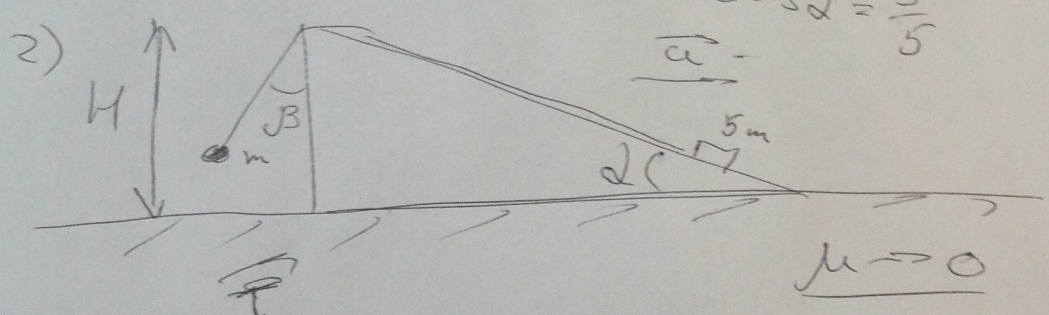
Also $T \cos \alpha = N \sin \alpha$
 $T = N \tan \alpha$

$T = 5mg \frac{\tan \alpha}{\cos \alpha} = \frac{5mg}{\cos \alpha}$

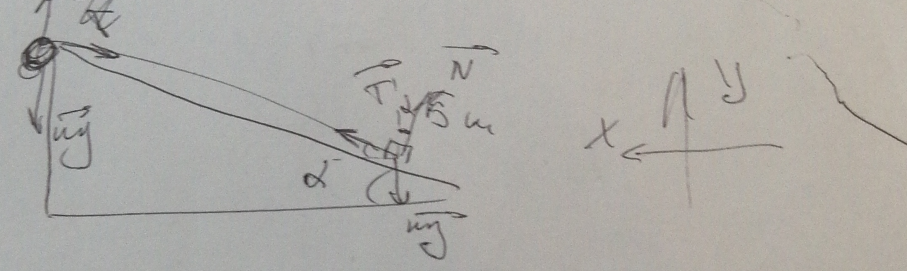
$T = mg$
 $\frac{5}{1} \frac{1}{N} T = mg$
 $\frac{\tan \alpha}{\cos \alpha} = 5 \frac{4}{3} = \frac{20}{3}$
 $\frac{100}{5} - \frac{117}{5} = \frac{180}{5}$

use 1/100

republican $\tan \alpha = \frac{4}{3}$
 $\tan \beta = \frac{12}{5}$ $\cos \beta = \frac{5}{13}$
 $u = \text{const}$ $\cos \alpha = \frac{3}{5}$



1) ω / τ



$\frac{N}{\omega}$

$T = 5mg$ $5mg + T + N = 0$

y: $N \cos \alpha = 5mg$

x: $T \cos \alpha = N \sin \alpha$

$5mg \cos \alpha = N \sin \alpha$

$5mg = N \cos \alpha$

~~$T \cos \alpha = N \sin \alpha$~~

$T = N \tan \alpha$

$T = 5mg \frac{\tan \alpha}{\cos \alpha} = \frac{5mg}{\cos \alpha}$

$\frac{5mg}{\cos \alpha} = 5 \frac{4}{3}$

100 - 119 = 180

$\frac{5}{1} T = 5mg$

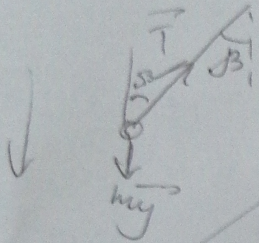
11

днет 3 ~~мислени~~

Физика 11 клас

3)

~~$$t = H \quad H = \frac{a_y t^2}{2}$$~~



~~$$a_y = g - \frac{T}{m} \quad (\text{из уравнения 4})$$

$$= g - \frac{g}{\cos \beta} =$$~~

~~$$= g \left(1 - \frac{1}{\cos \beta}\right) = 9,81 \left(1 - \frac{13}{5}\right)$$~~

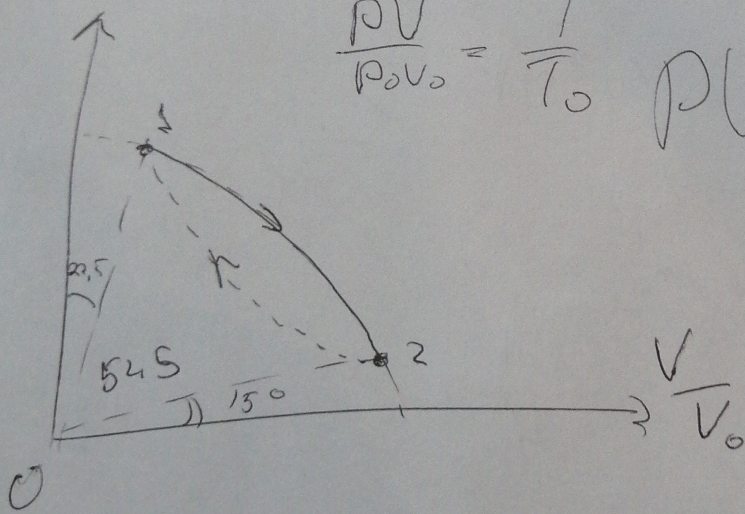
решил

$$C_V = \frac{5}{2} R$$

$$i = 5$$

$$\frac{pV}{p_0 V_0} = \frac{T}{T_0} \quad pV = \nu R T$$

$\frac{p}{p_0}$



$$90^\circ - 22,5 - 15 =$$

1/3/13

~~Handwritten scribbles~~

$$\frac{h^2 u^2}{2m} = \frac{h^2}{2m} = k^2 \frac{h^2}{2m}$$

$$E_k = \frac{1}{2} m v^2 = \frac{1}{2} m \left(\frac{h \nu}{m} \right)^2 = \frac{h^2 \nu^2}{2m}$$

$$P = \frac{1}{3} \rho v^2$$

$$P(\nu) = \frac{1}{\sqrt{R^2 - x^2}} = \frac{2}{\sqrt{R^2 - x^2}} \quad \cos 45^\circ = 2 \cos^2(22.5^\circ) \rightarrow$$

$$\frac{dP}{dR}$$

$$\frac{dP}{dT} \approx DR$$

$$\cos 23.5^\circ = \frac{\cos 45^\circ + 1}{2}$$

$$\frac{1}{\omega} \cdot k \cdot x = \rho \sin \theta$$

$$\lambda = \frac{h \nu}{k \cdot \nu} = \frac{h}{k} = \frac{h}{\frac{2\pi m v}{h}} = \frac{h^2}{2\pi m v}$$

$$h k T = \frac{h^2 \nu}{2\pi m v} = \frac{h^2 \nu}{2\pi m \frac{h \nu}{m}} = \frac{h^2 \nu}{2\pi h \nu} = \frac{h}{2\pi}$$

= P

$$\frac{1}{\sqrt{2}}$$

$$= \frac{2}{\sqrt{2}} = \sqrt{2}$$

$$\sqrt{\frac{4 + \sqrt{2}}{4}} = \sqrt{\frac{16 + 4\sqrt{2}}{16}}$$

1.

Чаc 1

Учeбнaя

Рeшeннaя 11кe

N2

Вapиaнт 11-04

Учeб I

Дaнo

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

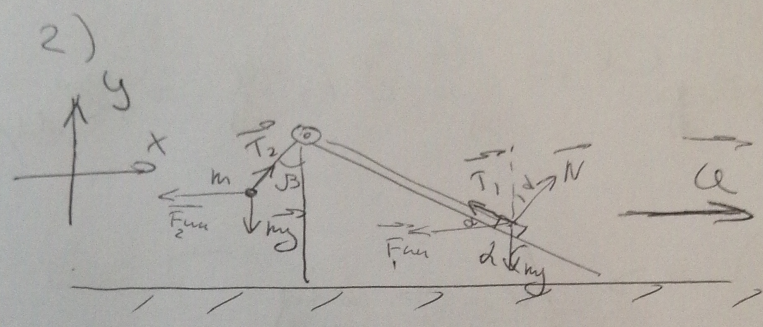
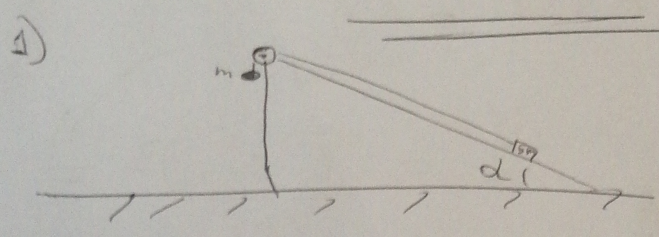
$$\cos \beta = \frac{5}{13}$$

$m = 5m$
 $\mu = 0$

1) $a = ?$

2) $a_{\delta} = ?$

3) $t = ?$



1) $F_{m1} = 5ma$

$F_{m2} = ma$

нepедгeннaя & HCO (тeм oбeзбeжeннaя)

$$|\vec{T}_1| = |\vec{T}_2| = T \text{ и нe мoжeт нe пoтoтeмнeтe}$$

и нe вoзвoщeтe

(m) $\vec{T}_2 + m\vec{y} + \vec{F}_{m2} = \vec{0}$

(5m) $\vec{T}_1 + \vec{N} + 5m\vec{y} + \vec{F}_{m1} = 5ma\vec{e}_x$

(y) 1) $T \cos \beta = my$ (1)

2) $N \cos \alpha = my$ (2)

(x) 1) $-ma + T \sin \beta = 0$ (3)

2) $-5ma + N \sin \alpha - T \cos \alpha = 5ma$ (4)

Часть 2

Олимпиада: **Физика, 11 класс (2 часть)**

Шифр: **21203426**

ID профиля: **801652**

Вариант 8

Quest 1
N3

quest 2
Berechnung 11-08
multibeen

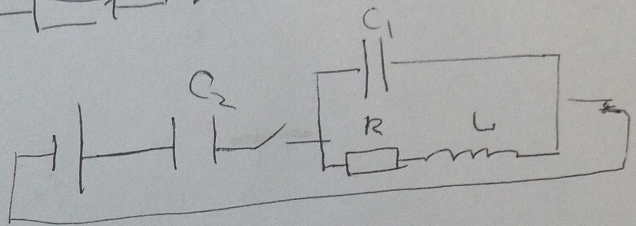
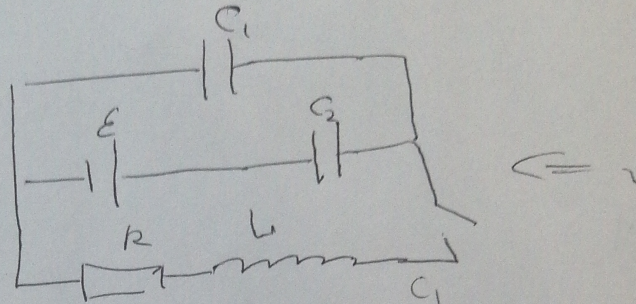
Physik
11.08

Demo

$$C_1 = C$$

$$C_2 = 5C$$

$$\frac{dI}{dt} = ?$$



$$C = \frac{q}{u}$$

$$\left(\varepsilon_{Si} = -L \frac{dI}{dt} \right) \Rightarrow \frac{dI}{dt} = \left| \frac{\varepsilon_{Si}}{L} \right|$$

(1) $U_L + U_R = U_{C1} \Rightarrow \varepsilon - \frac{q}{5C} = U_L + U_R = I R$ induktive
Widerstände
Zerlegen

(2) $U_{C1} + U_{C2} = \varepsilon \Rightarrow \frac{q}{C} + \frac{q}{5C} = \varepsilon$

$$\begin{aligned} \Rightarrow \left\{ \begin{aligned} \varepsilon - \frac{q}{5C} &= U_L = \varepsilon_{Si} \\ \frac{q}{C} + \frac{q}{5C} &= \varepsilon \end{aligned} \right. \Rightarrow \frac{6q}{5C} = \varepsilon \Rightarrow q = \frac{5C \cdot \varepsilon}{6} \end{aligned}$$

r.c.p $\varepsilon_{Si} = \frac{\varepsilon}{6} \Rightarrow \frac{dI}{dt} = \frac{\varepsilon}{L \cdot 6}$

Мет 2

метод 2
методом

Физика 11 кл

№3

$$Q^{\uparrow} ?$$

$$Q = Q_R^{\uparrow} = U \cdot I_{\Delta t} = \frac{U^2}{R} \Delta t$$

$$(\Delta) \Rightarrow \sum \frac{-5\epsilon}{6} = U_L + U_C \Leftrightarrow$$

$$\Leftrightarrow \frac{\epsilon}{6} = U_L + U_R \Leftarrow \rightarrow$$

где воле закончен, но не есть ток

$$\Leftrightarrow \frac{\epsilon}{6} = \mathcal{E}_{Si} + IR$$

~~Важно~~ когда нуле закончен

$$I_R = \frac{\epsilon}{6}$$

$$\mathcal{E}_{Si} \rightarrow 0$$

а когда закончен

$$\mathcal{E}_{Si} = \frac{\epsilon}{6}$$

Учет 1

вольт 2
электромаг
Вероятно 11-08

Физика 11м

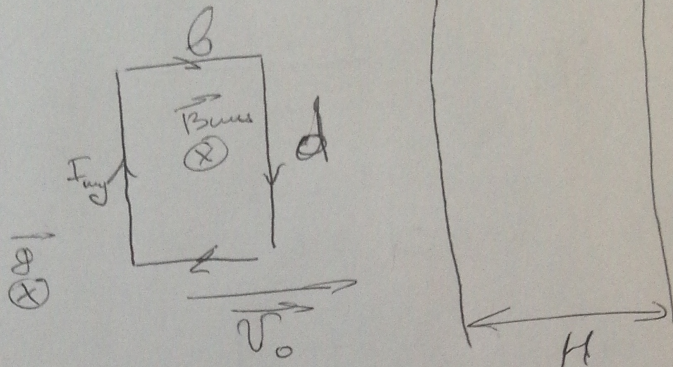
N 4

Дано:

m, d, v_0, R, B

$b = \frac{2}{3}d$

$H = 3d$



a-?

Т.к. одна сторона не успевает
 то мы можем считать амплитуду
 равную ширине ~~а~~

когда рамка входит в B, $\Phi \uparrow$ следовательно

рамка

по закону Фарадея

$$|E_{инд}| = \left| \frac{d\Phi}{dt} \right| \Rightarrow E_{инд} = \frac{B dS \cos(0^\circ)}{dt}$$

$$= B \cdot d \cdot \frac{2}{3}d \cdot v_0 = B d v_0$$

$$\vec{B}_{инд} \updownarrow B \sin \varphi \updownarrow$$

Лист 2

часть 2
четвертый

Рыжков Илья

N4

$$I = \frac{\mathcal{E}}{R} = \frac{B d \dot{\varphi}_0}{R}$$

$$\vec{F} = I(\vec{d} \times \vec{B}) = m \vec{a} \Rightarrow$$

$$\Rightarrow a = \frac{I d \cdot B \cdot l}{m} = \frac{B^2 d^2 \dot{\varphi}_0}{R m}$$

2) при уменьшении угла наклона катушки
вектор магнитной индукции $\downarrow \Rightarrow$

\Rightarrow увеличится $\mathcal{E}_{\text{инд}}$ и $B_{\text{инд}} \uparrow \vec{B}$

и наоборот: при увеличении угла наклона катушки $\uparrow \vec{B}$
 $a = \frac{B^2 d^2 \dot{\varphi}_0}{R m}$
 уменьшается

$$I = \frac{\mathcal{E}}{R} = \frac{B d \dot{\varphi}_0}{R} \Rightarrow t = \frac{R a}{B d \dot{\varphi}_0} =$$

=

Лекция
№5

Урок 2
Вопросы 11-08
расстояние

Физика 11 кл

Дано

$$\frac{D_1}{D_2} = 5$$

$$d = 25$$

3 P_0 - оптическая сила
линзы
толща
в первом случае $d \rightarrow +s$

$$(1) D_1 + P_0 = \frac{1}{f} + \left(\frac{1}{d}\right) \Rightarrow 0$$

во втором

$$(2) D_2 + P_0 = \frac{1}{f} + \frac{1}{d_2}$$

$$(1) \Rightarrow f = \frac{1}{D_1 + P_0} \stackrel{\frac{D_1}{D_2} = 5}{\downarrow} = \frac{1}{5D_2 + P_0}$$

$$(2) \Rightarrow D_2 + P_0 = \frac{1}{5D_2 + P_0} + \frac{1}{25} \Rightarrow$$

$$\Rightarrow D_2 = -\frac{1}{100 \text{ см}} = -0.01 \text{ дптр}$$

$$D_1 = -0.05 \text{ дптр}$$

т.е. рассеивающей
линзы

Задание, символ
толща

$$(3) P_0 = \frac{1}{f} + \frac{1}{x}$$

ν_5 лучи ν_{20} 2 микров

$$(4) - (3) \Rightarrow D_2 = \frac{1}{d_2} - \frac{1}{x} \Rightarrow$$

$$\Rightarrow -1 = \frac{1}{0,25} - \frac{1}{x} \Leftrightarrow -1 = 4 - \frac{1}{x} \Leftrightarrow$$

$$\Leftrightarrow \frac{1}{x} = 5 \Leftrightarrow x = \frac{1}{5} \text{ м} = 20 \text{ см}$$

⊂

2)

$d_3 = 50 \text{ см}$, D_3 лучи с осью

$$(4) D_3 + D_0 = \frac{1}{f} + \frac{1}{d_3}$$

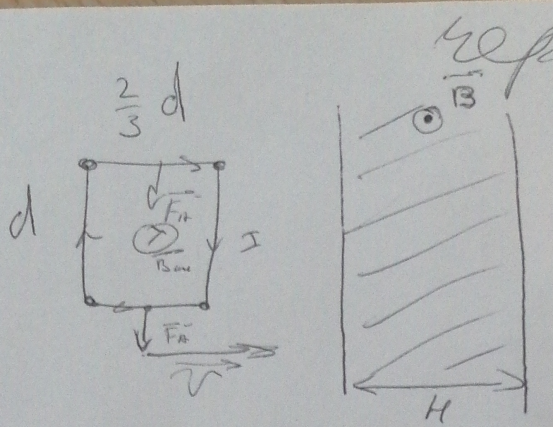
$$(4) - (4) \Rightarrow D_2 - D_3 = \frac{1}{0,25} - \frac{1}{0,5} = 4 - 2 = 2$$

$$D_1 = -5$$

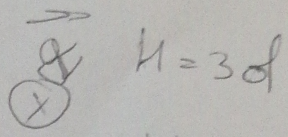
$$\Leftrightarrow -5 - D_3 = 2 \Leftrightarrow D_3 = -3 \text{ диоп}$$

Ответ 1) $x = 20 \text{ см}$, $D_1 = -5 \text{ диоп}$

2) $D_3 = -3 \text{ диоп}$



reproduced



V_0, d, R, B, m

$$H = k_u \cdot w/c \cdot T_n \quad T_n = \frac{1024 \pi \epsilon_1}{1024 \pi \epsilon_2} = \frac{w_2}{c \cdot k_n}$$

$$\vec{F}_A = q (\vec{v} \times \vec{B})$$

$$\epsilon = \frac{A_{cap}}{q} = \frac{D_{max}}{k_u}$$

$$\epsilon = \frac{H \cdot w}{k_u} = \frac{w_2 \cdot w_1^2}{k_u \epsilon^2} = \vec{F}_A$$

$$\epsilon = B l \cdot \sqrt{\sin(\theta) \cdot v}$$

$$\epsilon = 2 B d v$$

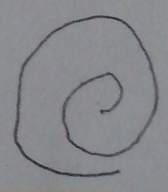
$$\frac{\epsilon d q_0}{dt} = B \left(d^2 \frac{2}{3} \right) \frac{d}{dt}$$

$$= B \cdot \frac{2}{3} d \cdot \frac{d}{dt} = \frac{B d^2}{3 v}$$

$$l = \frac{2}{3} d \frac{v dt}{dt} = \tau \quad \epsilon = \frac{B d l}{v}$$

$$\vec{F}_e = m \vec{v} \quad m \vec{v} = \delta$$

$$F = B I (L \times B)$$

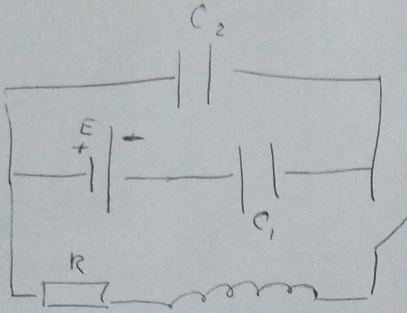


reproblem

11-08

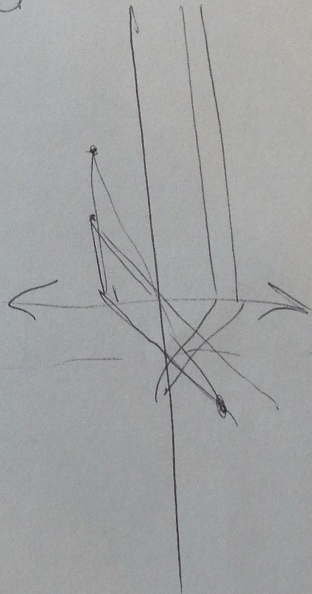
$C_1 = C$

$C_2 = 5C$

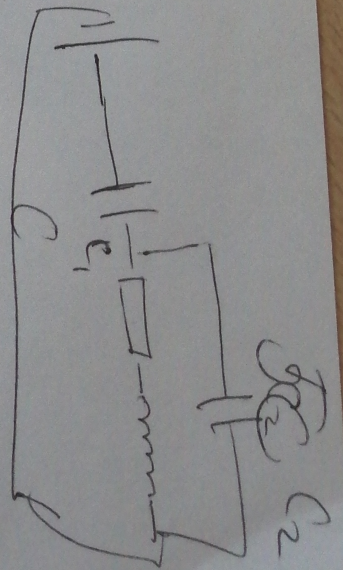


~~$f = \frac{1}{5} + D_0$~~
 $f = \frac{1}{5} + D_0$

D



D_0



~~$D_1 + D_0 = f + \frac{1}{5}$~~
 $D_1 = 5D_2$
 $D_1 + D_0 = f + \frac{1}{5}$

~~$D_2 + D_0 = f$~~
 $D_2 + D_0 = \frac{1}{5} + D_0$

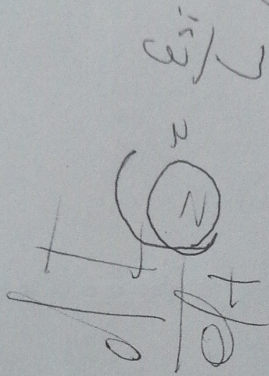
Лист 2
N5

задача 2
матрица

Презентация 11 кв

2) уг. скорость ω

$f = F_2 = 5 F_1 = 100 \text{ см}$

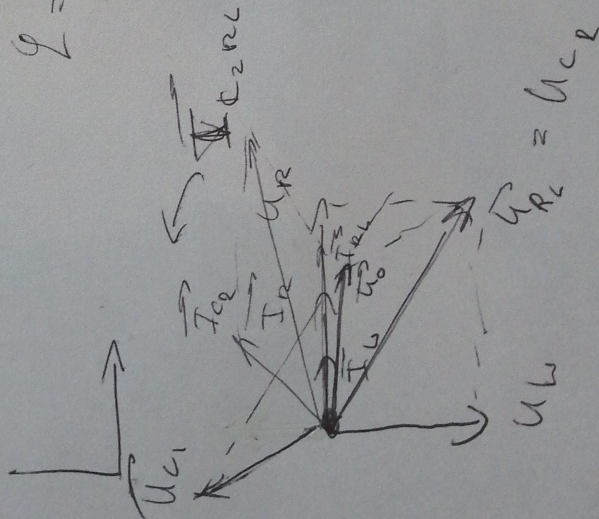


$\frac{d}{D}$

$F_{c1} = F_{c2} + F_{r2} + F_v$

$U_{c1} = U_{r2} = \dots$

$\varphi = c_4 C = \frac{\varphi}{\omega}$



Линза 1

Линза 2
необъект

Пыльца (1 мм)

N5
Дано

$$\frac{D_1 = 5}{D_2}$$

$$d = 25 \text{ см}$$

x = ?

$$\frac{D_1}{D_2} = \frac{F_2}{F_1} = 5$$

$$d \rightarrow \dots, F_2$$

$$\frac{1}{d} + \frac{1}{f} = \frac{1}{F_2}$$

бо объект очень

$$f = F_2 = 5 F_1$$

то изображение вынесо
на бесконечность

$$d = 25 \text{ см}$$

не объект очень

$$\frac{1}{d} + \frac{1}{f} = \frac{1}{F_1} \Rightarrow \frac{1}{25} + \frac{1}{5 F_1} = \frac{1}{F_1} \Leftrightarrow$$

$$\Leftrightarrow \frac{F_1 + 5}{25 F_1} = \frac{25}{25 F_1} \Leftrightarrow \frac{F_1 + 20}{25 F_1} = 0 \Leftrightarrow$$

$$\Leftrightarrow F_1 = 20 \text{ см}$$

сейчас $F \rightarrow 0$ и объект находится в $\infty \rightarrow 0$

$$\frac{1}{d} + \frac{1}{f} = \frac{1}{F}$$

$$\Rightarrow d = F_1 = 20 \text{ см}$$

$$D_2 = \frac{1}{F_2} = \frac{1}{5 \cdot 20} = 1 \text{ диоп}$$

Задача 1

Учебник 2

Решение 11 м

~~Учебник~~

Решение 11-08

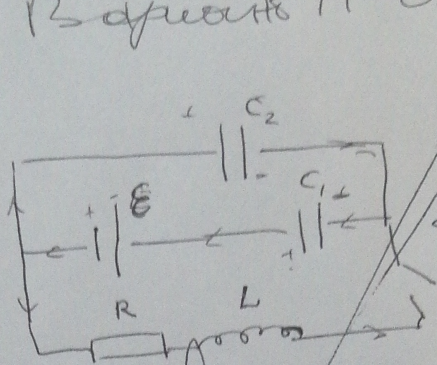
N 3

Дано

$$C_1 = 0$$

$$C_2 = 50$$

$$\frac{dI}{dt} = 1$$



$$U = IR$$

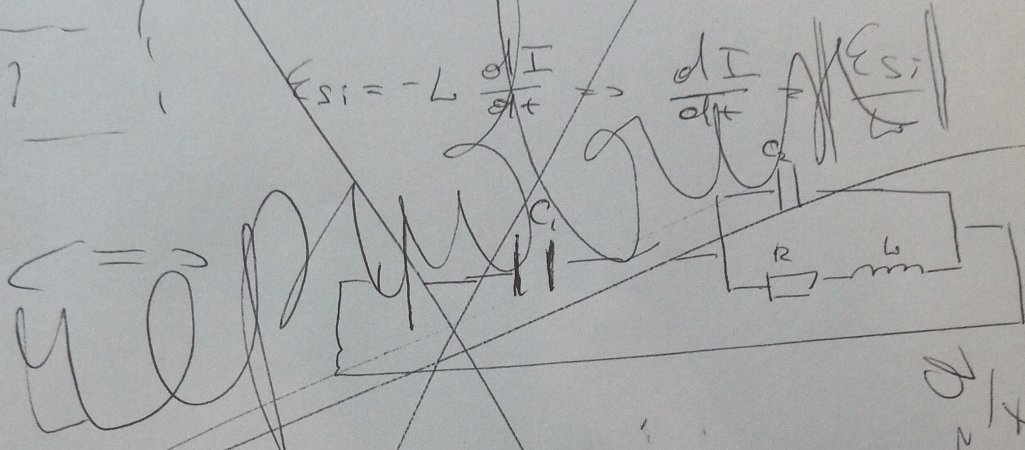
$$I = \frac{E}{R} - \frac{dI}{dt} \cdot \frac{L}{R}$$

$$t = \frac{E}{\frac{dI}{dt} \cdot \frac{L}{R}}$$

$$U = IR$$

$$I = \frac{U}{R}$$

$$q = \int I dt$$

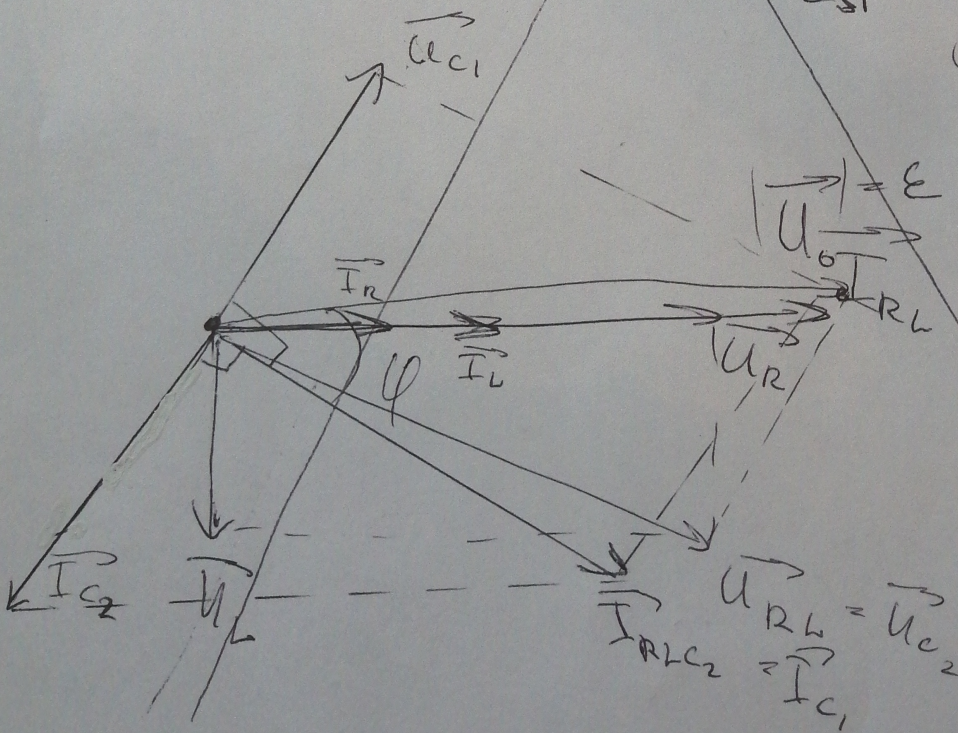


~~Векторная диаграмма~~

$$E_{Si} = -$$

$$- \left(\frac{R dI}{dt} \right) = \frac{dU}{dt}$$

$$I = \frac{dU}{dt}$$



$$[U] = B = \frac{D_{21}}{k_{21}}$$

Ades R
W3 Robertson Rescue 11