

II ( )

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-3 20

1

R.

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OY

OX-

$$v_{0y} = v \sin \alpha$$

$$v_{0x} = v (1 - \cos \alpha)$$

$$y = h + v \sin \alpha t - \frac{gt^2}{2}$$

$$h = R (1 - \cos \alpha)$$

t

$$v_y = v \sin \alpha - g t \quad 0 = v \sin \alpha - g t$$

$$t = v \sin \alpha / g$$

t<sub>0</sub>

$$0 = h + v \sin \alpha t_0 - \frac{gt_0^2}{2}$$

$$t_0^2 - 2 t_0 v \sin \alpha / g - 2h/g = 0$$

$$t_0 = v \sin \alpha / g + \sqrt{\frac{v^2 \sin^2 \alpha}{g^2} + \frac{2gh}{g}} = \frac{v \sin \alpha + \sqrt{v^2 \sin^2 \alpha + 2gh}}{g}$$

$$L = t_0 v_{0x} = \frac{v(1 - \cos \alpha)}{g} (v \sin \alpha + \sqrt{v^2 \sin^2 \alpha + 2gh})$$

- 80.

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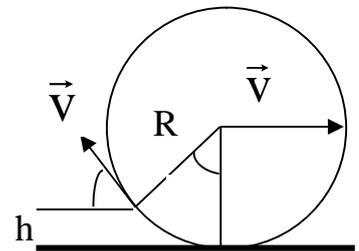
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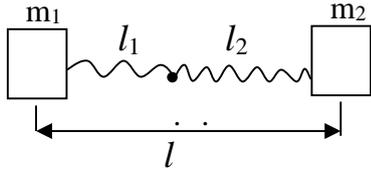
2

m<sub>1</sub> m<sub>2</sub>

k.

?





$l -$

$$l_1 = m_2 l / (m_1 + m_2)$$

$$l_2 = m_1 l / (m_1 + m_2)$$

$\Delta x$

$k \quad l,$

$l_1 \quad l_2.$

$$F \sim l. \quad F = k \Delta x \quad \Delta x = F/k$$

$$\Delta x_1 = F/k_1 \quad \Delta x_1 / \Delta x = l_1 / l = k / k_1$$

$$\Delta x_2 / \Delta x = l_2 / l = k / k_2$$

$$k_1 = k l / l_1 \quad k_1 = k (m_1 + m_2) / m_2$$

$$k_2 = k l / l_2 \quad k_2 = k (m_1 + m_2) / m_1$$

$$T_1 = 2\pi \sqrt{\frac{m_1}{k_1}} = 2\pi \sqrt{\frac{m_1 m_2}{k(m_1 + m_2)}} \quad T_2 = 2\pi \sqrt{\frac{m_2}{k_2}} = 2\pi \sqrt{\frac{m_1 m_2}{k(m_1 + m_2)}}$$

$$T_1 = T_2 = T$$

, ...

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$m = 2$

$$\Delta T = 5$$

$$Q = 9160$$

$\Delta U.$

$\mu = 0,032$

/

$$c_p = Q / m \quad T = 916 \quad /$$

$$A = p (V_2 - V_1) \quad p V_1 = m / \mu R T_1 \quad p V_2 = m / \mu R T_2$$

$$A = m / \mu p R (T_2 - T_1) = 2,59$$

$$Q = A + U \quad U = Q - A = 6,57$$

- 60.

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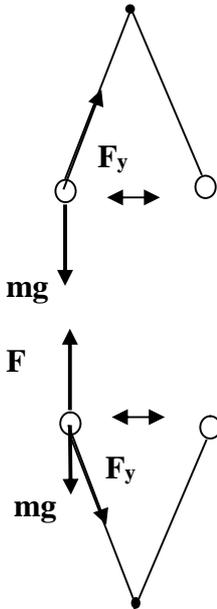
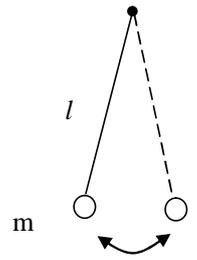
$m = 1$   
( . . . ).

$l = 36$  ,

$q = -200$  ,

$E = 100$  / ,

$E=0$



$$F = q E = 2 \cdot 10^{-7} \cdot 10^5 = 2 \cdot 10^{-2}$$

$$mg = 10^{-2}$$

$$F > mg$$

$$m \vec{g} \quad \vec{F}$$

$$\mathbf{F}_1 = \mathbf{F} - m \mathbf{g} = q \mathbf{E} - m \mathbf{g}.$$

$$F_y \sin \alpha .$$

$$F_y \approx mg \quad |F| = mg \sin \alpha = \Delta x \cdot mg / l \quad F = -k \Delta x$$

$$k = mg / l$$

$$T_0 = 2\pi \sqrt{\frac{m}{k}} = 2\pi \sqrt{\frac{l}{g}} \quad T_0 = 6,28 \sqrt{0,036} = 1,2c$$

$$T_1 = 2\pi \sqrt{\frac{m}{k_1}} \quad F_1 = (q E - m g) \sin \alpha = (q E - m g) \Delta x / l$$

$$k_1 = \frac{qE - mg}{l} \quad T_1 = 2\pi \sqrt{\frac{m}{qE - mg}}$$

$$T_1 = 6,28 \sqrt{\frac{10^{-3} \cdot 0,36}{2 \cdot 10^{-2} - 1 \cdot 10^{-2}}} = 1,2c$$

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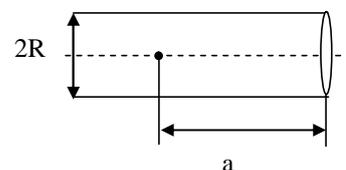
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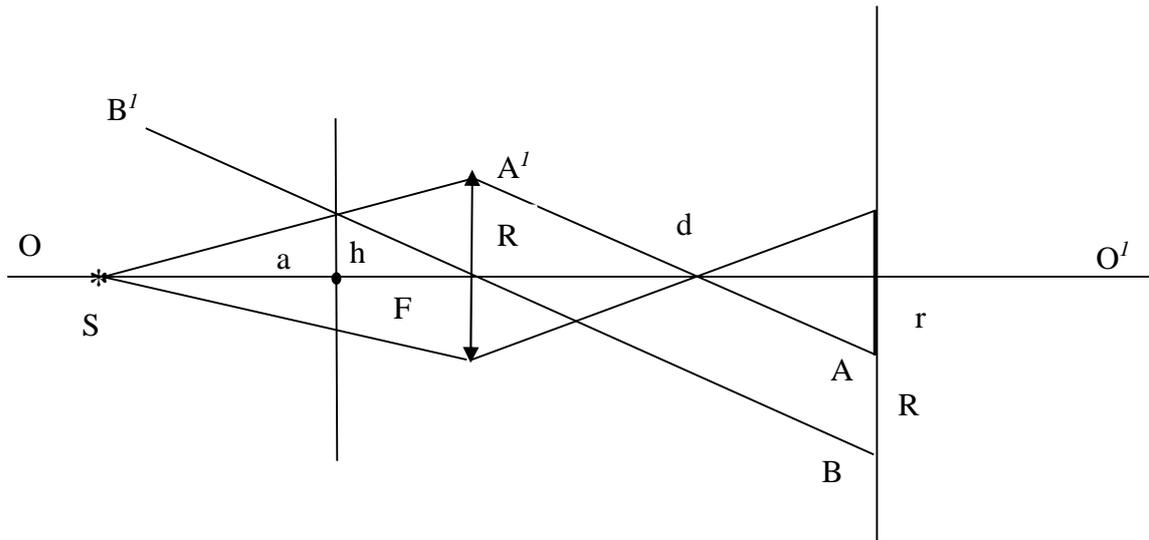
$R = 10$

$a = 20$

$d = 30$

$r = 5$





(c . . .).

S ;

$$d / (R + r) = F / h \quad h = \frac{F(R + r)}{d}$$

$$R/a = h/(a - F) \quad h = \frac{R(a - F)}{a}$$

$$\frac{F(R + r)}{d} = \frac{R(a - F)}{a} \quad Fa(R + r) = d Ra - d RF$$

$$F = \frac{d Ra}{d R + a(R + r)} = 10$$

- 80.

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