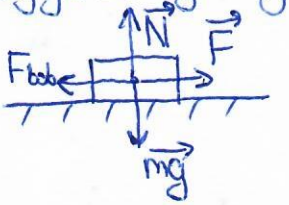
VIII зональ. 10 ნოემბერი. 2023.

Ელექტრონული ვერსია

1. $\vec{F}$: $S = 10$ მ
$m = 400$ გ $= 0{,}4$ კგ
$F = 2$ ნ
$\mu = 0{,}2$



$A_{mg} = 0$ 1ქ

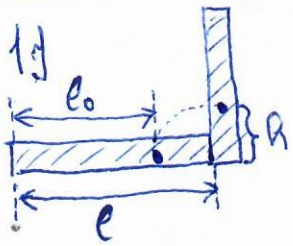
$A_N = 0$ 1ქ

$A_F = F \cdot S = 20$ ჯ. 1ქ

$A_{F_{ხახ}} = -F_{ხახ} \cdot S = -\mu mg \cdot S = -8$ ჯ. 2ქ

ხან: A_{mg}; A_N; $A_{F_{ხახ.}}$; A_F;

2. $m = 50$ კგ
$\ell = 10$ მ
$\ell_0 = 8$ მ



$A_{min} = mgh$ 1ქ

$h = \ell - \ell_0$ 1ქ

$A_{min} = mg(\ell - \ell_0)$ 1ქ

$A_{min} = 50 \cdot 10 \cdot 2 = 10^3$ ჯ 1ქ

$A_{min} = ?$

3. ϑ: $\vartheta = 720$ კმ/სთ $= 200$ მ/წმ
$N = 20$ ცხ.ძ $= 2 \cdot 10^7$ ვტ
$n = 2$ 1ქ

$F = \frac{N}{\vartheta}$ 2ქ

$F_0 = \frac{F}{n} = \frac{N}{\vartheta \cdot n} = 50$ კნ. 2ქ

$F_0 = ?$

4. $h = 10$ მ
$\vartheta = 10$ მ/წმ
$E = 300$ ჯ

$E_K + E_p = E$ 1ქ

$\frac{m\vartheta^2}{2} + mgh = E$ 2ქ

$m = \frac{E}{\frac{\vartheta^2}{2} + gh} = 2$ კგ. 2ქ

$m = ?$

5. $\vec{I}$: $0 - \vartheta$
$\vec{II}$: $\vartheta - 2\vartheta$

$\vec{I}$ $A_1 = \frac{m\vartheta_1^2}{2} - 0 = \frac{m\vartheta^2}{2}$ 2ქ

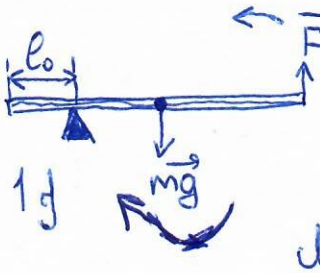
$\vec{II}$ $A_2 = \frac{m(2\vartheta)^2}{2} - \frac{m\vartheta^2}{2} = \frac{3m\vartheta^2}{2}$ 2ქ

$\frac{A_2}{A_1} = 3$ 1ქ

$\frac{A_2}{A_1} = ?$

6. მოც: $\ell = 1{,}3$ მ
$m = 40$ კგ
$\ell_0 = 30$ სმ $= 0{,}3$ მ

$F = ?$



$M_{mg} = M_F$ 1ქ

$M_{mg} = mg\left(\frac{\ell}{2} - \ell_0\right)$ 1ქ

$M_F = F(\ell - \ell_0)$ 1ქ

$$mg\left(\frac{\ell}{2} - \ell\right) = F(\ell - \ell_0)$$

$$F = \frac{mg\left(\frac{\ell}{2} - \ell_0\right)}{\ell - \ell_0} = 140\,\text{ნ} \quad 1\text{ქ}$$

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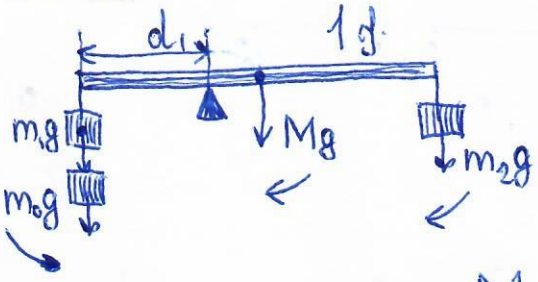
7. $d = 1$ მ
$d_1 = 20$ სმ $= 0{,}2$ მ
$m_2 = 10$ კგ
$M = 50$ კგ

$m_0 = ?$

(2) ძალა



(2)-ე ძალისთვის: $m_1gd_1 + m_0gd_1 = Mg\left(\frac{d}{2} - d_1\right) + m_2g(d - d_1$ 1ქ

მაგრამ (1) ძალისთვის ბერკეტი წონასწორობაშია:

$m_1gd_1 = Mg\left(\frac{d}{2} - d_1\right)$ 1ქ

მეორე ძალისთვის ანალოგიურად: $m_0gd_1 = m_2g(d - d_1)$ 1ქ

$$m_0 = m_2\frac{d - d_1}{d_1} = 40\,\text{კგ} \quad 1\text{ქ}$$

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8. მოც: (1) x
(2) $2x$

$\frac{E_2}{E_1} = ?$

$E_1 = \frac{kx^2}{2}$ 2ქ

$E_2 = \frac{k(3x)^2}{2}$ 2ქ

$\frac{E_2}{E_1} = 9$ 1ქ