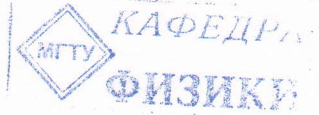
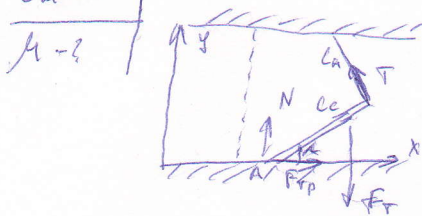


Задача 16

Ф-10-16



Дано
 $l_1 = l_2$ Решение



$$N + F_{тр} + T + mg = 0$$

$$T \cdot l = mg \cdot \frac{l}{2} \cos \alpha \Rightarrow T = \frac{mg}{2} \cos \alpha$$

$$X: F_{тр} - T \sin \alpha = 0$$

$$Y: N + T \cos \alpha - mg = 0$$

$$N = mg - T \cos \alpha = mg \left(1 - \frac{\cos^2 \alpha}{2}\right)$$

$$F_{тр} = \mu \cdot mg \left(1 - \frac{\cos^2 \alpha}{2}\right)$$

$$\mu = \frac{\cos \alpha \cdot \sin \alpha}{2 - \cos^2 \alpha}$$

$$\mu(\alpha) = \frac{\cos 2\alpha - \frac{1}{2} \sin^2 2\alpha}{(2 - \cos^2 \alpha)^2}$$

$$\mu(\alpha) = a = 45^\circ; \mu = \frac{1}{3}$$

$$\mu = \frac{1}{3}$$

Ответ: $\mu = \frac{1}{3}$ +

Задача 13

Дано
 $\alpha = 45^\circ$
 $L = 0,5 \text{ м}$
 $v_0 = 10 \text{ см}$
 $\omega = ?$

Решение
 $0,1 \text{ м}$

$$m a = mg + T$$

$$X: mg \sin \alpha + T \sin \alpha$$

$$Y: T \cos \alpha - mg$$

$$T = \frac{mg}{\cos \alpha}; m a = mg \tan \alpha$$

$$a = \omega^2 R = g \tan \alpha; \omega = \sqrt{\frac{g \tan \alpha}{R}}; R = L \sin \alpha$$

$$\omega = \sqrt{\frac{g \tan \alpha}{L \sin \alpha}} = \sqrt{\frac{g}{L \cos \alpha}}$$

$$\omega = 4,6 \text{ с}^{-1}$$

Ответ: $\omega = 4,6 \text{ с}^{-1}$

+ X 5 39 Aug

Задача 11

Дано
 m
 h
 A

Решение

$$\frac{m v^2}{2} = 0 = A_T + A_N + A_{Tр}$$

$$A_N = 0$$

$$A_T = mgh$$

$$\frac{m v^2}{2} = mgh - |A_{Tр}|$$

$$mg + N + F_{тр} + F = 0$$

$$F - mg \sin \alpha - F_{тр} = 0$$

$$N - mg \cos \alpha = 0$$

$$F = mg \sin \alpha + F_{тр}$$

$$A = (mg \sin \alpha + F_{тр}) \cdot \frac{h}{\sin \alpha} = mgh + |A_{Tр}| \Rightarrow |A_{Tр}| = A - mgh$$

$$\frac{m v^2}{2} = mgh - (A - mgh) = 2mgh - A$$

$$v = \sqrt{\frac{2(2mgh - A)}{m}}$$

Ответ: $v = \sqrt{\frac{2(2mgh - A)}{m}}$

+

Задача 14

Дано
 $R = 100 \text{ кПа}$
 $V = ?$

Решение

$$A = \frac{R}{b} (T - T_0) = -\frac{R}{b} \Delta T \Rightarrow a = \left(\frac{3}{2} - \frac{1}{b}\right) R \Delta C \Rightarrow C = \frac{R}{a} \left(\frac{3}{2} - \frac{1}{b}\right) \cdot R$$

$$0 < b < \frac{3}{2}$$

$$V_{max} = \frac{2V}{5}$$

$$X = \frac{4V}{5} = \frac{2V}{5}$$

$$P_2 S = mg \Rightarrow \frac{5 \sqrt{RT_2}}{4V} S = mg$$

$$-4U = \frac{3}{2} UR (T_1 - T_2) = mgh$$

$$\frac{3}{2} UR (T_1 - T_2) = \frac{5 \sqrt{RT_2}}{4V} S \cdot \frac{2V}{5S} \Rightarrow 21(T_1 - T_2) = 4T_2$$

$$T_2 = \frac{21}{25} T_1$$

$$\frac{P_2}{P_1} = \frac{T_2}{T_1} \cdot \frac{V_1}{V_2} = \frac{3}{5} \Rightarrow P_2 = \frac{3}{5} P_1 = 60 \text{ кПа}$$

Ответ: $P_2 = \frac{3}{5} P_1 = 60 \text{ кПа}$