

Dinamika: ariketak

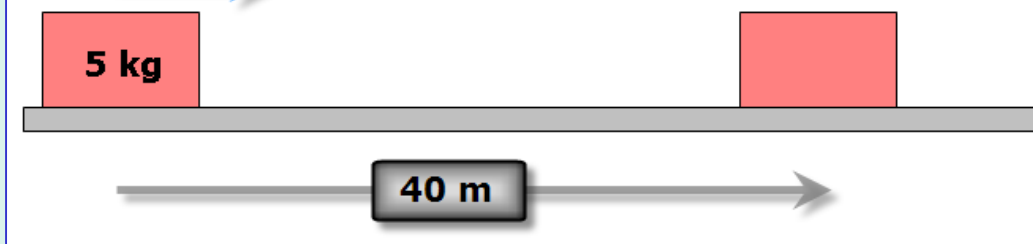
Ariketa # 1

Kalkulatu taulako balioak

Magnitudea	Balioa
P (pisua)	
N (normala)	
F_r (marrusk.)	
μ (marr. koef.)	
a (azelerazioa)	
m (masa)	5 kg

hasierako abiadura:

8 m/s



$$\vec{r} = (8t + \frac{1}{2}at^2)\vec{i} \text{ (m)} \rightarrow \vec{v} = (8 + at)\vec{i} \text{ (m/s)}$$

Baldintza: $x = 40 \text{ m} \leftrightarrow v = 0$ (gelditzen da)

$$\begin{cases} 8t + \frac{1}{2}at^2 = 40 \rightarrow 8t + \frac{1}{2}(a \cdot t) \cdot t = 40 \rightarrow 8t - 4t = 40 \\ 8 + at = 0 \rightarrow a \cdot t = -8 \end{cases}$$

$t = 10 \text{ s}$

$$a = -0.8 \text{ m/s}^2$$

$$P = m \cdot g = 5 \text{ Kg} \cdot 10 \frac{\text{m}}{\text{s}^2} = \boxed{50 \text{ N}}$$

$$N = P = \boxed{50 \text{ N}}$$

$$F_r = F_T = m \cdot a = 5 \text{ Kg} \cdot (-0.8 \text{ m/s}^2) = \boxed{-4 \text{ N}}$$

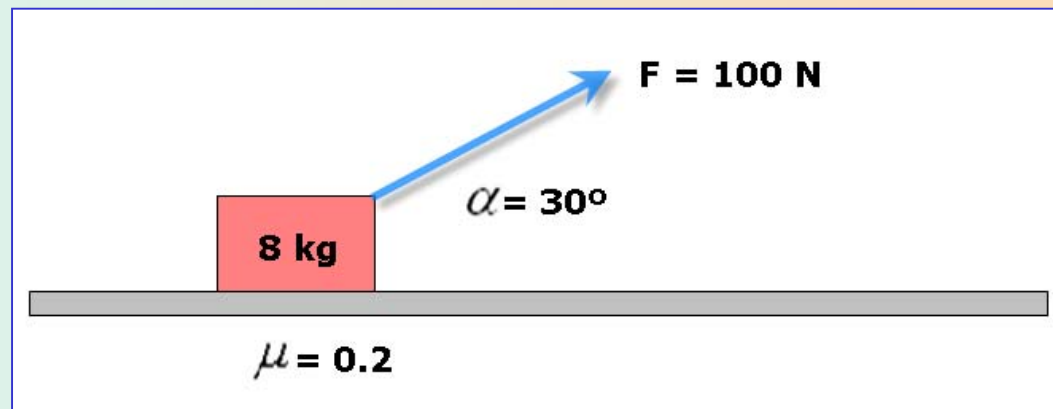
$$F_r = \mu \cdot N \rightarrow \underset{\substack{\uparrow \\ \text{balio} \\ \text{absolutoa}}}{4 \text{ N}} = \mu \cdot 50 \text{ N} \rightarrow \mu = \frac{4 \text{ N}}{50 \text{ N}} = \boxed{0.08}$$

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Ariketa # 2

Kalkulatu taulako balioak

Magnitudea	Balioa
P (pisua)	
N (normala)	
F_r (marrusk.)	
μ (marr. koef.)	0.2
F (kanpoko)	100 N
a (azelerazioa)	
α (F-ren angelua)	30°
m (masa)	8 kg



$$P = m \cdot g = 8 \text{ kg} \cdot 10 \text{ m/s}^2 = \boxed{80 \text{ N}}$$

$$N + F_y = P \quad \xrightarrow{F_y = F \cdot \sin 30^\circ} \quad N + 50 \text{ N} = 80 \text{ N} \rightarrow N = \boxed{30 \text{ N}}$$

$$F_r = \mu \cdot N = 0.2 \times 30 \text{ N} = \boxed{6 \text{ N}} \text{ (negatiboa)}$$

$$F_T = m \cdot a \quad \xrightarrow{F_x = F \cdot \cos 30^\circ} \quad F_x - 6 \text{ N} = 8 \text{ kg} \cdot a \quad \xrightarrow{80.6 \text{ N} = 8 \text{ kg} \cdot a}$$

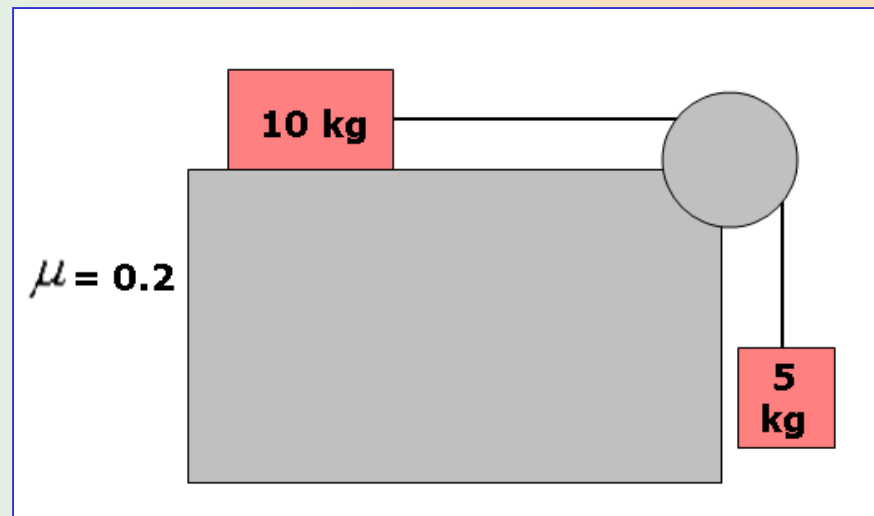
$$a = \frac{80.6 \text{ N}}{8 \text{ kg}} = \boxed{10.1 \text{ m/s}^2}$$

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Ariketa # 3

Kalkulatu taulako balioak

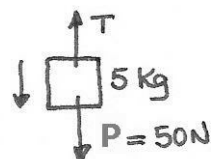
Magnitudea	Balioa
N (normala)	
T (tentsioa)	
F_r (marrusk.)	
μ (marr. koef.)	0.2
a (azelerazioa)	



$$N = P_2 = 10 \text{ Kg} \cdot 10 \text{ m/s}^2 = \boxed{100 \text{ N}}$$

$$F_r = \mu \cdot N = 0.2 \times 100 \text{ N} = \boxed{20 \text{ N}} \text{ (negatiboa)}$$

$$F_T = m \cdot a \rightarrow 50 \text{ N} - 20 \text{ N} = (10 \text{ Kg} + 5 \text{ Kg}) \cdot a \rightarrow a = \frac{30 \text{ N}}{15 \text{ Kg}} = \boxed{2 \text{ m/s}^2}$$



$$50 \text{ N} - T = 5 \text{ Kg} \cdot 2 \text{ m/s}^2 = 10 \text{ N}$$

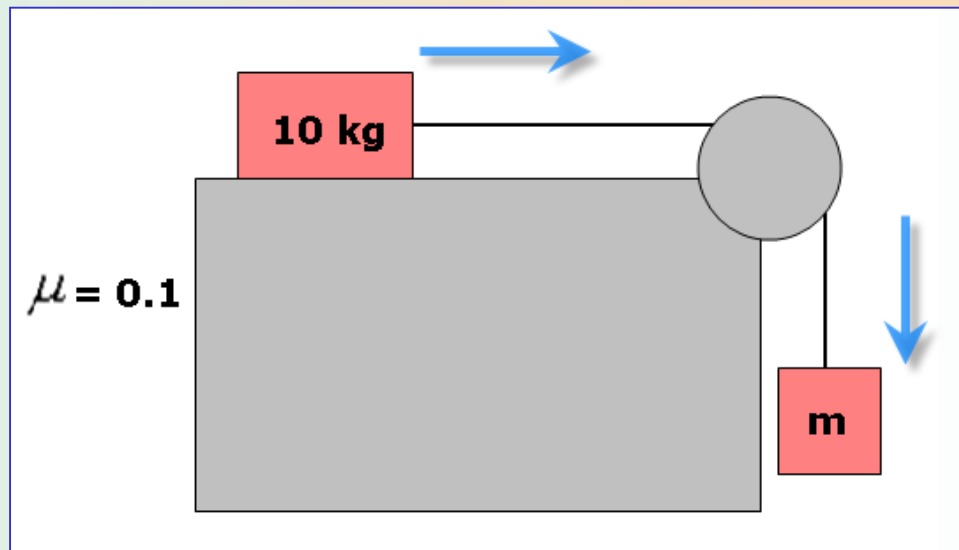
$$\boxed{T = 40 \text{ N}}$$

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Ariketa # 4

Kalkulatu taulako balioak

Magnitudea	Balioa
N (normala)	
T (tentsioa)	
F_r (marrusk.)	
μ (marr. koef.)	0.1
a (azelerazioa)	2.5 m/s^2
m (masa)	



$$N = P_2 = 10 \text{ Kg} \cdot 10 \text{ m/s}^2 = \boxed{100 \text{ N}}$$

$$F_r = \mu \cdot N = 0.1 \times 100 \text{ N} = \boxed{10 \text{ N}} \text{ (negatiboa)}$$

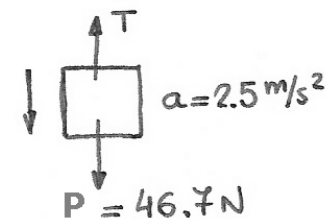
$$F_{\text{tot}} = m \cdot a \rightarrow m \cdot 10 \text{ m/s}^2 - 10 \text{ N} = (10 \text{ Kg} + m) \times 2.5 \text{ m/s}^2 \rightarrow$$

$$\rightarrow m \times 10 \frac{\text{m}}{\text{s}^2} - 10 \text{ N} = 25 \text{ N} + m \times 2.5 \frac{\text{m}}{\text{s}^2} \rightarrow m \left(10 \frac{\text{m}}{\text{s}^2} - 2.5 \frac{\text{m}}{\text{s}^2} \right) = 35 \text{ N}$$

$$m = \frac{35 \text{ N}}{7.5 \text{ m/s}^2} = \boxed{4.67 \text{ Kg}}$$

$$F_{\text{tot}} = m \cdot a \rightarrow 46.7 \text{ N} - T = 4.67 \text{ Kg} \times 2.5 \frac{\text{m}}{\text{s}^2}$$

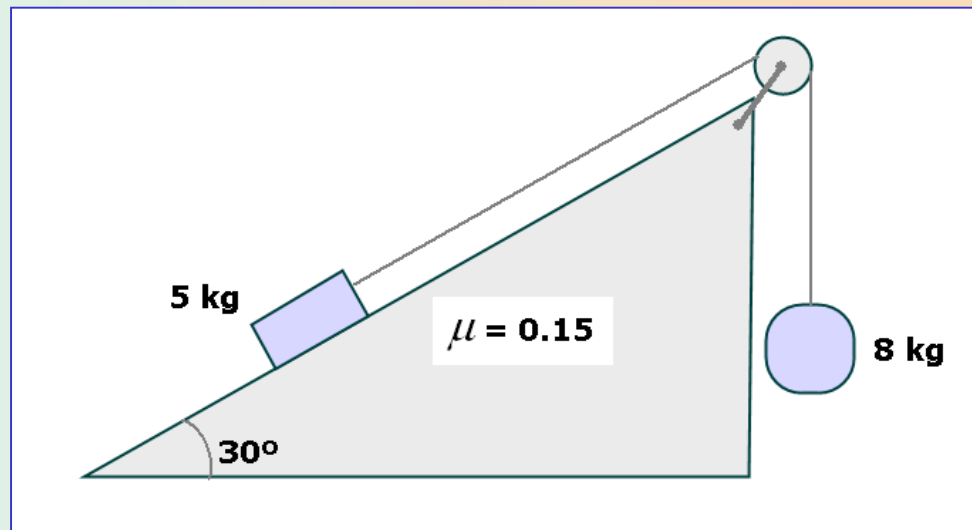
$$T = \boxed{35 \text{ N}}$$



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Ariketa # 5

Kalkulatu taulako balioak



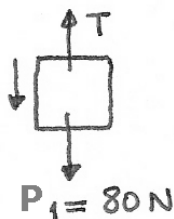
Magnitudea	Balioa
N (normala)	
T (tentsioa)	
F_r (marrusk.)	
μ (marr. koef.)	0.15
a (azelerazioa)	

$$N = P_{2y} = P_2 \times \cos 30^\circ = \boxed{43.3 \text{ N}}$$

$$F_r = \mu \cdot N = 0.15 \times 43.3 \text{ N} = \boxed{6.5 \text{ N}} \text{ (negatiboa)}$$

$$F_{\text{tot}} = m \cdot a \rightarrow P_1 - F_r - P_{2x} = (8 \text{ Kg} + 5 \text{ Kg}) \cdot a$$

$$80 \text{ N} - 6.5 \text{ N} - 25 \text{ N} = 13 \text{ Kg} \cdot a \rightarrow a = \frac{48.5 \text{ N}}{13 \text{ Kg}} = \boxed{3.7 \text{ m/s}^2}$$



$$F_{\text{tot}} = m \cdot a \rightarrow 80 \text{ N} - T = 8 \text{ Kg} \times 3.7 \text{ m/s}^2$$

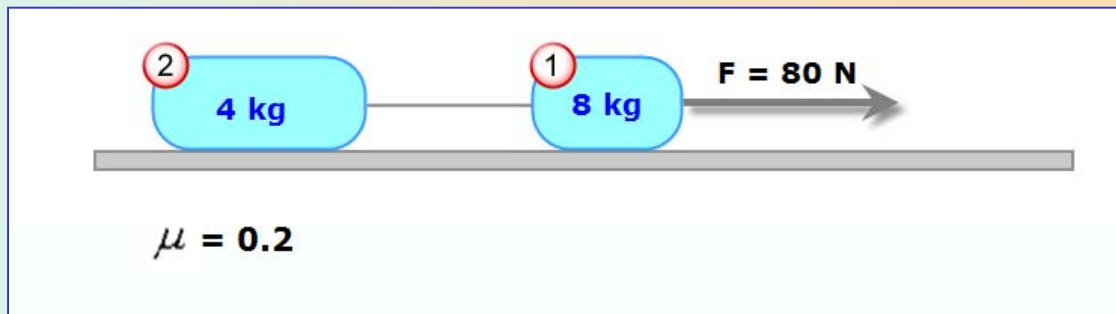
$$\boxed{T = 50.4 \text{ N}}$$

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Ariketa # 6

Kalkulatu taulako balioak

Magnitudea	Balioa
P (pisua)	$P_1 =$ $P_2 =$
N (normala)	$N_1 =$ $N_2 =$
F_r (marrusk.)	$F_{R1} =$ $F_{R2} =$
μ (marr. koef.)	0.2
F (kanpoko)	80 N
a (azelerazioa)	



$$P_1 = \boxed{80\text{ N}}; \quad P_2 = \boxed{40\text{ N}}$$

$$N_1 = P_1 = \boxed{80\text{ N}}; \quad N_2 = P_2 = \boxed{40\text{ N}}$$

$$F_{r1} = \mu \cdot N_1 = 0.2 \times 80\text{ N} = \boxed{16\text{ N}} \quad (\text{negatiboa})$$

$$F_{r2} = \mu \cdot N_2 = 0.2 \times 40\text{ N} = \boxed{8\text{ N}} \quad (\text{negatiboa})$$

$$F_{\text{tot.}} = m \cdot a \rightarrow 80\text{ N} - 16\text{ N} - 8\text{ N} = (8\text{ Kg} + 4\text{ Kg}) \cdot a$$

$$a = \frac{56\text{ N}}{12\text{ Kg}} = \boxed{4.67\text{ m/s}^2}$$