

PRIPREMA → Rješenja

1. a) $3 \text{ kPa} = 3000 \text{ Pa}$ b) $40 \text{ Pa} = 0,04 \text{ kPa}$ c) $120000 \text{ Pa} = 1,2 \text{ bara}$
d) $0,3 \text{ bara} = 30000 \text{ Pa}$ e) $450 \text{ N} = 0,45 \text{ kPa}$ f) $17,8 \text{ kN} = 17800 \text{ N}$
g) $0,2 \text{ m}^2 = 2000 \text{ cm}^2$ h) $1200 \text{ dm} = 0,12 \text{ km}$ i) $2 \text{ m}^3 = 2000 \text{ dm}^3 = 2000 \text{ L}$

2. $m = 65 \text{ kg}$
 $g = 10 \text{ N/kg}$

a) $G = ?$

$G = m \cdot g$
 $G = 65 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$
 $G = 650 \text{ N}$

b) na pod

c) $F_g = G$
 $F_g = 650 \text{ N}$

d) $g_{\text{JUPITER}} = 24,8 \text{ N/kg}$

$G = m \cdot g$
 $G = 65 \text{ kg} \cdot 24,8 \frac{\text{N}}{\text{kg}}$
 $G = 1612 \text{ N}$

$m_{\text{JUPITER}} = 65 \text{ kg}$

3. $m = 75 \text{ g} = 0,075 \text{ kg}$
 $g = 10 \text{ N/kg}$

$G = ?$

$G = m \cdot g$
 $G = 0,075 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$
 $G = 0,75 \text{ N}$

4. $G_1 = 8,5 \text{ N}$ (1 cigla)
 $g = 10 \text{ N/kg}$

$m_3 \text{ cigle} = ?$

1 cigla: $G_1 = m_1 \cdot g$
 $m_1 = G_1 : g$
 $m_1 = 8,5 \text{ N} : 10 \frac{\text{N}}{\text{kg}}$
 $m_1 = 0,85 \text{ kg}$

3 cigle: $m_3 = 3 \cdot m_1$
 $m_3 = 3 \cdot 0,85 \text{ kg}$
 $m_3 = 2,55 \text{ kg}$

5. $m = 73 \text{ kg}$
 $G = 116,8 \text{ N}$

$g = ?$

$G = m \cdot g$
 $g = G : m$
 $g = 116,8 \text{ N} : 73 \text{ kg}$
 $g = 1,6 \frac{\text{N}}{\text{kg}}$

6. $m = 15 \text{ kg}$
 $\mu = 0,5$

$F_{\text{tr}} = ?$

$F_{\text{tr}} = \mu \cdot G$

$F_{\text{tr}} = \mu \cdot (m \cdot g)$

$F_{\text{tr}} = 0,5 \cdot 15 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$

$F_{\text{tr}} = 75 \text{ N}$

RASPISATI FORMULU ZA TEŽINU!

7.) $G = 120 \text{ N}$
 $m = 10 \text{ kg}$ (brat)
 $\mu = 5\% = 0,05$
 $g = 10 \text{ N/kg}$

$F_v = ?$

$F_v \Rightarrow$ vúčna sila

$G_{uk} = G_{SAONICA} + G_{BRATA}$

$G_{uk} = 120 \text{ N} + m_{BRATA} \cdot g$

$G_{uk} = 120 \text{ N} + 10 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$

$G_{uk} = 120 \text{ N} + 100 \text{ N}$

$G_{uk} = 220 \text{ N}$

$F_v = F_{tr}$

$F_{tr} = \mu \cdot G_{uk}$

$F_{tr} = 0,05 \cdot 220 \text{ N}$

$F_{tr} = 11 \text{ N}$

$F_v = 11 \text{ N}$

8.) $F_v = 4,5 \text{ N}$
 $F_p = 6 \text{ N}$
 $g = 10 \text{ N/kg}$

$\mu = ?$

$F_p \Rightarrow$ pritiska sila

$F_p = G = 6 \text{ N}$

$F_{tr} = F_v = 4,5 \text{ N}$

$F_{tr} = \mu \cdot G$

$\mu = F_{tr} : G$

$\mu = 4,5 \text{ N} : 6 \text{ N}$

$\mu = 0,75$

9.) $G = 15 \text{ N}$
 $F_v = 6 \text{ N}$
 $\mu = ?$

$F_v = F_{tr} = 6 \text{ N}$

$F_{tr} = \mu \cdot G$

$\mu = F_{tr} : G$

$\mu = 6 \text{ N} : 15 \text{ N}$

$\mu = 0,4$

10.) $\mu = 0,035$
 $F = 150 \text{ N}$
 $g = 10 \text{ N/kg}$

$G = ?$ $m = ?$

$F = F_{tr}$

$F_{tr} = \mu \cdot G$

$G = F_{tr} : \mu$

$G = 150 \text{ N} : 0,035$

$G = 4285,7 \text{ N}$

$G = m \cdot g$

$m = G : g$

$m = 4285,7 \text{ N} : 10$

$m = 428,57 \text{ kg}$

11.* $V = 90000 \text{ cm}^3 = 9 \text{ m}^3$ a) $\rho = \frac{m}{V}$

$\mu = 0,5$

$\rho_{BETON} = 2300 \text{ kg/m}^3$

$g = 10 \text{ N/kg}$

$G = ?$ $F_v = ?$ $F_{tr} = ?$

$1 \text{ m}^2 = 10000 \text{ cm}^2$

$m = \rho_{BETON} \cdot V$

$m = 2300 \frac{\text{kg}}{\text{m}^3} \cdot 9 \text{ m}^3$

$m = 20700 \text{ kg}$

$G = m \cdot g$

$G = 20700 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$

b) $F_{tr} = \mu \cdot G$

$F_{tr} = 0,5 \cdot 207000 \text{ N}$

$F_{tr} = 103500 \text{ N}$

b) $F_v = F_{tr} = 103500 \text{ N}$

$$(12) V = 2 \text{ dm}^3 = 0,002 \text{ m}^3$$

$$\rho_{\text{Al}} = 2700 \text{ kg/m}^3$$

$$g = 10 \text{ N/kg}$$

$$G = ?$$

$$\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V$$

$$m = 2700 \frac{\text{kg}}{\text{m}^3} \cdot 0,002 \text{ m}^3$$

$$m = 5,4 \text{ kg}$$

$$G = m \cdot g$$

$$G = 5,4 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$\underline{\underline{G = 54 \text{ N}}}$$

$$(13) a = 30 \text{ cm} = 0,3 \text{ m}$$

$$b = 20 \text{ cm} = 0,2 \text{ m}$$

$$c = 25 \text{ cm} = 0,25 \text{ m}$$

$$\rho_{\text{wood}} = 1000 \text{ kg/m}^3$$

$$g = 10 \text{ N/kg}$$

$$G = ?$$

$$V = a \cdot b \cdot c$$

$$V = 0,3 \text{ m} \cdot 0,2 \text{ m} \cdot 0,25 \text{ m}$$

$$V = 0,015 \text{ m}^3$$

$$\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V$$

$$m = 1000 \frac{\text{kg}}{\text{m}^3} \cdot 0,015 \text{ m}^3$$

$$m = 15 \text{ kg}$$

$$G = m \cdot g$$

$$G = 15 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$\underline{\underline{G = 150 \text{ N}}}$$

$$(14) F_1 = 400 \text{ N}$$

$$l_1 = 2 \text{ m}$$

$$l_2 = 1,5 \text{ m}$$

$$F_2 = ?$$

$$F_1 \cdot l_1 = F_2 \cdot l_2$$

$$400 \text{ N} \cdot 2 \text{ m} = F_2 \cdot 1,5 \text{ m}$$

$$800 \text{ N} = 1,5 \cdot F_2$$

$$F_2 = 800 \text{ N} : 1,5$$

$$\underline{\underline{F_2 = 533,3 \text{ N}}}$$

$$(15) m_1 = 30 \text{ kg}$$

$$l_1 = 2,5 \text{ m}$$

$$m_2 = 40 \text{ kg}$$

$$l_2 = ?$$

$$F_1 \cdot l_1 = F_2 \cdot l_2$$

$$300 \text{ N} \cdot 2,5 \text{ m} = 400 \text{ N} \cdot l_2$$

$$750 \text{ m} = 400 \cdot l_2$$

$$l_2 = 750 \text{ m} : 400$$

$$\underline{\underline{l_2 = 1,875 \text{ m}}}$$

$$F_1 = m_1 \cdot g$$

$$F_1 = 30 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$F_1 = 300 \text{ N}$$

$$F_2 = m_2 \cdot g$$

$$F_2 = 40 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$F_2 = 400 \text{ N}$$

$$(16)^* l_{\text{lux}} = 24 \text{ cm} \text{ (duljina cijele poluge)}$$

$$F_1 = 6 \text{ N}$$

$$F_2 = 4 \text{ N}$$

$$l_1 = ? \quad l_2 = ?$$

$$l_{\text{lux}} = l_1 + l_2 \Rightarrow l_1 = l_{\text{lux}} - l_2$$

$$l_1 = 0,24 \text{ m} - l_2$$

$$F_1 \cdot l_1 = F_2 \cdot l_2$$

$$6 \text{ N} \cdot (0,24 \text{ m} - l_2) = 4 \text{ N} \cdot l_2$$

$$6 \text{ N} \cdot 0,24 \text{ m} - 6 \text{ N} \cdot l_2 = 4 \text{ N} \cdot l_2$$

$$1,44 \text{ m} - 6 \cdot l_2 = 4 \cdot l_2$$

$$1,44 \text{ m} = 4 \cdot l_2 + 6 \cdot l_2$$

$$1,44 \text{ m} = 10 \cdot l_2$$

$$l_2 = 1,44 \text{ m} : 10$$

$$\underline{\underline{l_2 = 0,144 \text{ m}}}$$

$$l_1 = l_{\text{lux}} - l_2$$

$$l_1 = 0,24 \text{ m} - 0,144 \text{ m}$$

$$\underline{\underline{l_1 = 0,096 \text{ m}}}$$

$$\begin{aligned} (17.) \quad F_1 \cdot l_1 &= F_2 \cdot l_2 \\ 1F \cdot 5l &= 2F \cdot 2l \\ 5Fl &= 4Fl \\ 5 &\neq 4 \end{aligned}$$

$$\begin{aligned} (18.) \quad l_1 &= 12 \text{ cm} \\ F_1 &= 50 \text{ N} \\ l_2 &= 8 \text{ cm} \\ \hline F_2 &= ? \end{aligned}$$

$$\begin{aligned} F_1 \cdot l_1 &= F_2 \cdot l_2 \\ 50 \text{ N} \cdot 12 \text{ cm} &= F_2 \cdot 8 \text{ cm} \\ 600 \text{ N} &= 8 \cdot F_2 \\ F_2 &= 600 \text{ N} : 8 \\ \hline F_2 &= 75 \text{ N} \end{aligned}$$

(19.) B) Tijelo je stabilnije što mu je težište bliže podlozi i što mu je površina oslonca veća.

$$\begin{aligned} (20.) \quad m &= 30 \text{ kg} \\ A &= 2 \text{ m}^2 \\ \hline p &= ? \\ G &= m \cdot g \\ G &= 30 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \\ G &= 300 \text{ N} \\ G &= F \end{aligned}$$

$$\begin{aligned} p &= \frac{F}{A} \\ p &= \frac{300 \text{ N}}{2 \text{ m}^2} \\ \hline p &= 150 \text{ Pa} \end{aligned}$$

$$\begin{aligned} (21.) \quad m &= 84 \text{ kg} \\ p &= 48 \text{ kPa} = 48000 \text{ Pa} \\ \hline A &= ? \\ G &= m \cdot g \\ G &= 84 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \\ G &= 840 \text{ N} \\ G &= F \end{aligned}$$

$$\begin{aligned} p &= \frac{F}{A} \\ A &= \frac{F}{p} \\ A &= \frac{840 \text{ N}}{48000 \text{ Pa}} \\ \hline A &= 0,0175 \text{ m}^2 \approx 0,02 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} (22.) \quad A &= 30 \text{ cm}^2 = 0,003 \text{ m}^2 \\ p &= 75000 \text{ Pa} \\ \hline F &= ? \\ p &= \frac{F}{A} \\ F &= p \cdot A \\ F &= 75000 \text{ Pa} \cdot 0,003 \text{ m}^2 \\ \hline F &= 225 \text{ N} \end{aligned}$$

$$\begin{aligned} (23.) \quad m &= 0,27 \text{ kg} \\ p &= 50 \text{ Pa} \\ \hline A &= ? \\ F &= G \\ G &= m \cdot g \\ G &= 0,27 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \\ G &= 2,7 \text{ N} \end{aligned}$$

$$\begin{aligned} p &= \frac{F}{A} \\ A &= \frac{F}{p} \\ A &= \frac{2,7 \text{ N}}{50 \text{ Pa}} \\ \hline A &= 0,054 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} (24.) \quad m &= 80 \text{ kg} \\ a &= 2 \text{ m} \\ b &= 10 \text{ cm} = 0,1 \text{ m} \\ \hline p &= ? \\ A &= a \cdot b \\ A &= 2 \text{ m} \cdot 0,1 \text{ m} \\ A &= 0,2 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} F &= G \\ G &= m \cdot g \\ G &= 80 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \\ G &= 800 \text{ N} \end{aligned}$$

$$\begin{aligned} p &= \frac{F}{A} \\ p &= \frac{800 \text{ N}}{0,2 \text{ m}^2} \\ \hline p &= 4000 \text{ Pa} \end{aligned}$$

$$m = 40 \text{ kg}$$

$$V = 250 \text{ L} = 250 \text{ dm}^3 = 0,25 \text{ m}^3$$

$$p = 5,8 \text{ kPa} = 5800 \text{ Pa}$$

$$A = ?$$

$$f = \frac{m}{V} \Rightarrow m_{\text{vode}} = f \cdot V$$

$$m = 1000 \frac{\text{kg}}{\text{m}^3} \cdot 0,25 \text{ m}^3$$

$$m = 250 \text{ kg}$$

$$G = m \cdot g$$

$$G = 290 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$p = \frac{F}{A}$$

$$G = 2900 \text{ N}$$

$$A = \frac{F}{p}$$

$$G = F$$

$$A = \frac{2900 \text{ N}}{5800 \text{ Pa}}$$

$$\underline{\underline{A = 0,5 \text{ m}^2}}$$

$$m_{\text{uk}} = m_{\text{akvarij}} + m_{\text{vode}}$$

$$m_{\text{uk}} = 40 \text{ kg} + 250 \text{ kg}$$

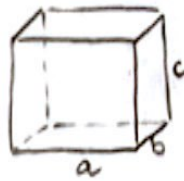
$$m_{\text{uk}} = 290 \text{ kg}$$

$$\textcircled{26.} \quad a = 40 \text{ cm} = 0,4 \text{ m}$$

$$b = 10 \text{ cm} = 0,1 \text{ m}$$

$$c = 20 \text{ cm} = 0,2 \text{ m}$$

$$m = 20 \text{ dag} = 0,2 \text{ kg}$$



$$b) G = ?$$

$$G = m \cdot g$$

$$G = 0,2 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$\underline{\underline{G = 2 \text{ N}}}$$

$$a) p_{\text{min}} = ?$$

$p \sim \frac{1}{A}$ (najmanji tlak tlači najveću površinu kvadra)

$$A = a \cdot c \text{ (najveća površina)}$$

$$A = 0,4 \text{ m} \cdot 0,2 \text{ m}$$

$$A = 0,08 \text{ m}^2$$

$$p = \frac{F}{A}$$

$$p = \frac{2 \text{ N}}{0,08 \text{ m}^2}$$

$$\underline{\underline{p = 25 \text{ Pa}}}$$

$$\textcircled{27.}^* \quad A = 0,2 \text{ dm}^2 = 0,002 \text{ m}^2$$

$$c = 50 \text{ cm} = 0,5 \text{ m}$$

$$\rho_{\text{stakar}} = 8900 \text{ kg/m}^3$$

$$p = ?$$

$$V = A \cdot c$$

$$V = 0,002 \text{ m}^2 \cdot 0,5 \text{ m}$$

$$V = 0,001 \text{ m}^3$$

$$f = \frac{m}{V} \Rightarrow m = f \cdot V$$

$$m = 8900 \frac{\text{kg}}{\text{m}^3} \cdot 0,001 \text{ m}^3$$

$$m = 8,9 \text{ kg}$$

$$p = \frac{F}{A}$$

$$p = \frac{89 \text{ N}}{0,2 \text{ m}^2}$$

$$\underline{\underline{p = 445 \text{ Pa}}}$$

$$G = m \cdot g$$

$$G = 8,9 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$