

NUMERIČKI ZADACI:

1. (a) $m = 5 \text{ kg}$
 $g = 10 \frac{\text{N}}{\text{kg}}$

$$G = m \cdot g$$
$$G = 5 \cancel{\text{kg}} \cdot 10 \frac{\text{N}}{\cancel{\text{kg}}}$$
$$\boxed{G = 50 \text{ N}}$$

(b) $m = 45 \text{ dag} = 0,45 \text{ kg}$
 $g = 10 \frac{\text{N}}{\text{kg}}$

$$G = m \cdot g$$
$$G = 0,45 \cancel{\text{kg}} \cdot 10 \frac{\text{N}}{\cancel{\text{kg}}}$$
$$\boxed{G = 4,5 \text{ N}}$$

(c) $m = 320 \text{ g} = 0,32 \text{ kg}$
 $g = 10 \frac{\text{N}}{\text{kg}}$

$$G = m \cdot g$$
$$G = 0,32 \cancel{\text{kg}} \cdot 10 \frac{\text{N}}{\cancel{\text{kg}}}$$
$$\boxed{G = 3,2 \text{ N}}$$

2. $G = 4 \text{ N}$
 $g = 10 \frac{\text{N}}{\text{kg}}$

$$m = \frac{G}{g}$$
$$m = \frac{4 \cancel{\text{N}}}{10 \frac{\cancel{\text{N}}}{\text{kg}}}$$
$$\boxed{m = 0,4 \text{ kg}}$$

3. $m = 0,7 \text{ t} = 700 \text{ kg}$
 $g = 10 \frac{\text{N}}{\text{kg}}$

$$F_g = m \cdot g$$
$$F_g = 700 \cancel{\text{kg}} \cdot 10 \frac{\text{N}}{\cancel{\text{kg}}}$$
$$\boxed{F_g = 7000 \text{ N}}$$

4. $a = 13 \text{ cm}$
 $b = 56 \text{ mm} = 5,6 \text{ cm}$
 $c = 0,24 \text{ dm} = 2,4 \text{ cm}$
 $\rho = 0,7 \frac{\text{g}}{\text{cm}^3}$

$$G = ?$$
$$V = a \cdot b \cdot c$$
$$V = 13 \text{ cm} \cdot 5,6 \text{ cm} \cdot 2,4 \text{ cm}$$
$$V = 174,72 \text{ cm}^3$$

$$m = \rho \cdot V$$
$$m = 0,7 \frac{\text{g}}{\text{cm}^3} \cdot 174,72 \cancel{\text{cm}^3}$$
$$m = 122,304 \text{ g}$$
$$\boxed{m \approx 0,122 \text{ kg}}$$

5. $G = 135 \text{ N}$
 $\mu = 0,24$

$$F_{\text{tr}} = ?$$
$$F_{\text{tr}} = \mu \cdot G$$
$$F_{\text{tr}} = 0,24 \cdot 135 \text{ N}$$
$$\boxed{F_{\text{tr}} = 32,4 \text{ N}}$$

6. $G = 25 \text{ N}$
 $\mu = 30\% = 0,3$

$$F_{\text{tr}} = F_v = ?$$
$$F_{\text{tr}} = \mu \cdot G$$
$$F_{\text{tr}} = 0,3 \cdot 25$$
$$\boxed{F_{\text{tr}} = 7,5 \text{ N}}$$

$$G = m \cdot g$$
$$G = 0,122 \cancel{\text{kg}} \cdot 10 \frac{\text{N}}{\cancel{\text{kg}}}$$
$$\boxed{G = 1,22 \text{ N}}$$

7. $G = 15 \text{ N}$
 $F_v = F_{\text{tr}} = 6 \text{ N}$
 $\mu = ?$

$$\mu = \frac{F_{\text{tr}}}{G} = \frac{6 \cancel{\text{N}}}{15 \text{ N}} = 0,4$$

8. (a) $\mu = 0,04$
 $F = F_{\text{tr}} = 120 \text{ N}$

$$G = \frac{F_{\text{tr}}}{\mu}$$
$$G = \frac{120 \text{ N}}{0,04} = 3000 \text{ N}$$

(b) $m = \frac{G}{g}$
 $m = \frac{3000 \cancel{\text{N}}}{10 \frac{\cancel{\text{N}}}{\text{kg}}}$
 $m = 300 \text{ kg}$

$$\textcircled{9} \quad m = 50 \text{ kg}$$

$$F_{\text{tr}} = F = 100 \text{ N}$$

$$\mu = ?$$

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

$$\mu = \frac{100 \text{ N}}{500 \text{ N}}$$

$$\boxed{\mu = 0,2}$$

$$G = m \cdot g$$

$$G = 50 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$\boxed{G = 500 \text{ N}}$$

$$\textcircled{10} \quad F_1 = 20 \text{ N}$$

$$l_2 = 25 \text{ cm}$$

$$F_2 = 8 \text{ N}$$

$$l_1 = ?$$

$$F_1 l_1 = F_2 l_2$$

$$20 \text{ N} \cdot l_1 = 8 \text{ N} \cdot 25 \text{ cm}$$

$$20 \text{ N} \cdot l_1 = 200 \text{ Ncm} \quad | : 20 \text{ N}$$

$$l_1 = \frac{200 \text{ Ncm}}{20 \text{ N}}$$

$$\boxed{l_1 = 10 \text{ cm}}$$

$$\textcircled{11} \quad m_1 = 30 \text{ kg}$$

$$l_1 = 3 \text{ m}$$

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

$$l_2 = ?$$

$$F_1 = G_1 = m_1 \cdot g = 30 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 300 \text{ N}$$

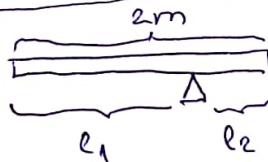
$$F_2 = G_2 = m_2 \cdot g = 40 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 400 \text{ N}$$

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

$$300 \text{ N} \cdot 3 \text{ m} = 400 \text{ N} \cdot l_2$$

$$900 \text{ Nm} = 400 \text{ N} \cdot l_2 \quad | : 400 \text{ N}$$

$$\boxed{l_2 = 2,25 \text{ m}}$$



$$\textcircled{12} \quad l = 2 \text{ m}$$

$$l_1 = 120 \text{ cm} = 1,2 \text{ m}$$

$$F_1 = 400 \text{ N}$$

$$m_2 = ?$$

$$l_2 = l - l_1$$

$$l_2 = 2 \text{ m} - 1,2 \text{ m} = \underline{\underline{0,8 \text{ m}}}$$

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

$$400 \text{ N} \cdot 1,2 \text{ m} = F_2 \cdot 0,8 \text{ m}$$

$$480 \text{ Nm} = F_2 \cdot 0,8 \text{ m} \quad | : 0,8 \text{ m}$$

$$F_2 = \frac{480 \text{ Nm}}{0,8 \text{ m}}$$

$$\boxed{F_2 = 600 \text{ N}}$$

$$F_2 = G_2 = 600 \text{ N}$$

$$m_2 = \frac{G_2}{g}$$

$$m_2 = \frac{600 \text{ N}}{10 \frac{\text{N}}{\text{kg}}}$$

$$\boxed{m_2 = 6 \text{ kg}}$$

$$\begin{aligned} \textcircled{13} \quad l &= 24 \text{ cm} \\ F_1 &= 6 \text{ N} \\ F_2 &= 4 \text{ N} \\ l_1, l_2 &= ? \end{aligned}$$

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

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

$$144 - 6l_2 = 4l_2$$

$$-6l_2 - 4l_2 = -144$$

$$-10l_2 = -144 \quad | :(-10)$$

$$l_2 = 14,4 \text{ cm}$$

$$l_1 + l_2 = 24 \text{ cm}$$

$$l_1 = 24 - l_2$$

$$l_1 = 24 - 14,4$$

$$l_1 = 9,6 \text{ cm}$$

$$\textcircled{14} \quad F_1 = 20 \text{ N}$$

$$l_1 = 10 \text{ cm}$$

$$l_2 = 8 \text{ cm}$$

$$F_2 = ?$$

$$F_1 l_1 = F_2 l_2$$

$$20 \text{ N} \cdot 10 \text{ cm} = F_2 \cdot 8 \text{ cm}$$

$$200 \text{ Ncm} = F_2 \cdot 8 \text{ cm} \quad | : 8 \text{ cm}$$

$$F_2 = \frac{200 \text{ Ncm}}{8 \text{ cm}}$$

$$F_2 = 25 \text{ N}$$

$$\begin{aligned} \textcircled{15} \quad (a) \quad & 11500 \text{ Pa} \\ (b) \quad & 1,33 \text{ bara} \\ (c) \quad & 120000 \text{ Pa} \\ (d) \quad & 600 \text{ Pa} \\ (e) \quad & 320 \text{ hPa} \end{aligned}$$

$$\textcircled{16} \quad F = G = 250 \text{ N}$$

$$A = 1,5 \text{ m}^2$$

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

$$p = \frac{250 \text{ N}}{1,5 \text{ m}^2}$$

$$p = 16,67 \text{ Pa}$$

$$\textcircled{17} \quad F = G = 950 \text{ N}$$

$$A = 200 \text{ cm}^2 = 0,02 \text{ m}^2$$

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

$$p = \frac{950 \text{ N}}{0,02 \text{ m}^2}$$

$$p = 47500 \text{ Pa}$$

$$\textcircled{18} \quad m = 120 \text{ g} = 0,12 \text{ kg}$$

$$A = 10 \text{ cm}^2 = 0,001 \text{ m}^2$$

$$F = G = m \cdot g$$

$$G = 0,12 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$G = 1,2 \text{ N}$$

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

$$p = \frac{1,2 \text{ N}}{0,001 \text{ m}^2}$$

$$p = 1200 \text{ Pa}$$

$$\textcircled{19} \quad m = 0,4 \text{ kg}$$

$$p = 70 \text{ Pa}$$

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

$$A = \frac{4 \text{ N}}{70 \text{ Pa}}$$

$$A = 0,06 \text{ m}^2$$

$$F = G = m \cdot g$$

$$G = 0,4 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

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

$$\textcircled{20} \quad A = 12 \text{ cm}^2 = 0,0012 \text{ m}^2$$

$$p = 75 \text{ kPa} = 75000 \text{ Pa}$$

$$F = p \cdot A$$

$$F = 75000 \text{ Pa} \cdot 0,0012 \text{ m}^2$$

$$F = 90 \text{ N}$$

21) $m = 80 \text{ kg}$
 $a = 2 \text{ m}$
 $b = 10 \text{ cm} = 0,1 \text{ m}$
 $p = ?$

$A = 2 \cdot a \cdot b$ (2 skije)
 $A = 2 \cdot 2 \text{ m} \cdot 0,1 \text{ m}$
 $A = 0,4 \text{ m}^2$

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

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

$p = \frac{800 \text{ N}}{0,4 \text{ m}^2}$

$p = 2000 \text{ Pa}$

22) $A = 120 \text{ m}^2$
 $h = 40 \text{ cm} = 0,4 \text{ m}$
 $\rho = 0,6 \frac{\text{g}}{\text{cm}^3} = 600 \frac{\text{kg}}{\text{m}^3}$

$\frac{\text{g}}{\text{cm}^3} \xrightarrow{\cdot 1000} \frac{\text{kg}}{\text{m}^3}$

$V = A \cdot h$

$V = 120 \text{ m}^2 \cdot 0,4 \text{ m}$

$V = 48 \text{ m}^3$

$m = \rho \cdot V$

$m = 600 \frac{\text{kg}}{\text{m}^3} \cdot 48 \text{ m}^3$

$m = 28800 \text{ kg}$

$F = G = m \cdot g$

$G = 28800 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$

$G = 288000 \text{ N}$

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

$p = \frac{288000 \text{ N}}{120 \text{ m}^2}$

$p = 2400 \text{ Pa}$

23) $m = 400 \text{ g} = 0,4 \text{ kg}$
 $G_v = 2,4 \text{ N}$
 $F_u = ?$

$G_z = m \cdot g$

$G_z = 0,4 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$

$G_z = 4 \text{ N}$

$F_u = G_z - G_v$

$F_u = 4 \text{ N} - 2,4 \text{ N}$

$F_u = 1,6 \text{ N}$

(24) $m_1 = 40 \text{ kg}$
 $V_2 = 250 \text{ L} \Rightarrow m_2 = 250 \text{ kg}$ } $m = m_1 + m_2$
 $m = 290 \text{ kg}$
 $p = 5,8 \text{ kPa} = 5800 \text{ Pa}$

$F = G = m \cdot g$
 $G = 290 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$
 $G = 2900 \text{ N}$

$p = \frac{F}{A} \Rightarrow A = \frac{F}{p}$
 $A = \frac{2900 \text{ N}}{5800 \text{ Pa}}$
 $A = 0,5 \text{ m}^2$

KONCEPTUALNI:

1. (b) 2. (a) 3. (b) 4. (a) 5. Kada stoji uspravno jer joj je oslonac veći. 
6. Stabilniji je toranj od 6 kocki jer mu je težište niže.
 7. Neće jer težišnica prolazi osloncem. (crtež je obavezan)
 8. (a) 9. (a) 10. Neće. Veći je uzgon u morskoj vodi jer je njena gustoća veća.