

## TLAK SILE

Naloge, str. 150

Naloga 1: Podplat in peta ženskega čevlja imata površino okrog  $15 \text{ cm}^2$ .  
S kolikšnim tlakom pritiska na vodoravna tla  $60 \text{ kg}$  teža ženska, če stoji na obeh nogah?

$$S = 15 \text{ cm}^2$$

$$m = 60 \text{ kg}$$

$$p_1 = ?$$

$$(g = 10 \text{ m/s}^2)$$

$$(1 \text{ bar} = 100.000 \text{ Pa}) \\ = 10^5 \text{ N/m}^2)$$

• Tlak sile (obe obutvi)

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

$$p = \frac{600 \text{ N}}{15 \cdot 10^{-4} \text{ m}^2}$$

$$p = 400.000 \text{ N/m}^2$$

$$p = 4 \text{ bar}$$

Sila teže:  $F_g = m \cdot g$

$$F_g = 60 \text{ kg} \cdot 10 \frac{\text{m}}{\text{s}^2}$$

$$F_g = 600 \text{ N}$$

• Tlak sile (ena obutvi)  
(en podplac)

$$p_1 = \frac{p}{2}$$

$$p_1 = \frac{4 \text{ bar}}{2}$$

$$p_1 = 2 \text{ bar}$$

Naloga 2: 10-kilogramska krogla leži na vodoravnih tleh. Kolikšna je površina stične ploskve krogle in tal, če pritiska krogla na tla s tlakom  $20 \text{ bar}$ ?

$$m = 10 \text{ kg}$$

$$p = 20 \text{ bar} = 20 \cdot 10^5 \frac{\text{N}}{\text{m}^2}$$

$$S = ?$$

$$(1 \text{ bar} = 10^5 \frac{\text{N}}{\text{m}^2})$$

• Tlak sile:  $p = \frac{F}{S} \quad | \cdot S / p$   
(enačba)

• Površina:  $S = \frac{F}{p}$

$$S = \frac{100 \text{ N}}{20 \text{ bar}} = \frac{10^2 \text{ N}}{20 \cdot 10^5 \frac{\text{N}}{\text{m}^2}}$$

$$S = \frac{10^2}{2 \cdot 10^6} \text{ m}^2 = \frac{1}{2} \cdot 10^2 \cdot 10^{-6} \text{ m}^2$$

$$S = 0,5 \cdot 10^{2-6} \text{ m}^2 = 0,5 \cdot 10^{-4} \text{ m}^2$$

$$S = 0,5 \text{ cm}^2$$

• Sila teže:  $F_g = m \cdot g$

$$F_g = 10 \text{ kg} \cdot 10 \frac{\text{m}}{\text{s}^2}$$

$$F_g = 100 \text{ N}$$

Naloga 3: Kocka s stranico 50 cm leži na vodoravnih tleh in pritiska na tla s tlakom 0,4 bar. Koliko tehta? Kolikšna je njena gostota?

$$a = 50 \text{ cm} = 0,5 \text{ m} \quad \text{a) Sila teže}$$

$$p = 0,4 \text{ bar} = 0,4 \cdot 10^5 \frac{\text{N}}{\text{m}^2}$$

$$\text{a) } m = ?$$

$$\text{b) } g = ?$$

$$(N = \text{kg} \cdot \frac{\text{m}}{\text{s}^2})$$

$$F_g = m \cdot g$$

$$m = \frac{F_g}{g}$$

$$m = \frac{10.000 \text{ N}}{10 \frac{\text{m}}{\text{s}^2}}$$

$$m = 1000 \text{ kg}$$

$$\underline{m = 1 \text{ t}}$$

$$\text{Tlak sile}$$

$$p = \frac{F}{S} \Rightarrow F = p \cdot S = p \cdot a^2$$

$$F = 0,4 \text{ bar} \cdot (0,5 \text{ m})^2$$

$$F = 0,4 \cdot 10^5 \frac{\text{N}}{\text{m}^2} \cdot 0,25 \text{ m}^2$$

$$F = \frac{40.000}{4} \text{ N}$$

$$\underline{F = 10.000 \text{ N}}$$

$$\text{b) Gostota}$$

$$\underline{\underline{\rho = \frac{m}{V} = \frac{m}{a^3} = \frac{1000 \text{ kg}}{(0,5 \text{ m})^3} = \frac{1000 \text{ kg}}{0,125 \text{ m}^3} = 8000 \frac{\text{kg}}{\text{m}^3} = 8 \frac{\text{g}}{\text{cm}^3}}}$$