



# PASKALOV ZAKON -zadaci-

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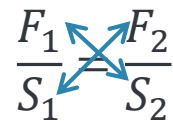
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1. Manji klip hidraulične dizalice ima površinu  $20 \text{ cm}^2$ , a veći  $80 \text{ cm}^2$ . Kolika je težina tereta koji se može podići ovom hidrauličnom dizalicom kada se na manji klip deluje silom  $100 \text{ N}$ ?

$$S_1 = 20 \text{ cm}^2$$

$$p_1 = p_2$$

$$S_2 = 80 \text{ cm}^2$$



$$F_1 \cdot S_2 = F_2 \cdot S_1$$

$$F_1 = 100 \text{ N}$$

$$F_2 = \frac{F_1 \cdot S_2}{S_1}$$

$$F_2 = Q = ?$$

$$F_2 = \frac{100 \text{ N} \cdot 80 \text{ cm}^2}{20 \text{ cm}^2}$$

$$F_2 = \frac{8000 \text{ N cm}^2}{20 \text{ cm}^2}$$

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

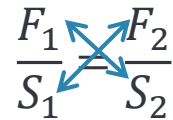
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2. Površina manjeg klipa hidraulične dizalice je  $10 \text{ cm}^2$ . Odredi površinu većeg klipa ako je za dizanje tereta mase  $100 \text{ kg}$  potrebno na manji klip delovati silom  $20 \text{ N}$ .

$$S_1 = 10 \text{ cm}^2$$

$$p_1 = p_2$$

$$m_2 = 100 \text{ kg}$$



$$F_1 \cdot S_2 = F_2 \cdot S_1$$

$$F_1 = 20 \text{ N}$$

$$S_2 = \frac{F_2 \cdot S_1}{F_1}$$

$$F_2 = m_2 \cdot g$$

$$S_2 = \frac{1000 \text{ N} \cdot 10 \text{ cm}^2}{20 \text{ N}}$$

$$F_2 = 100 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$S_2 = \frac{10\,000 \text{ N cm}^2}{20 \text{ N}}$$

$$F_2 = 1000 \text{ N}$$

$$S_2 = 500 \text{ cm}^2$$

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3. Površina većeg klipa hidraulične dizalice je 20 puta veći od površine manjeg klipa. Može li čovek mase 80 kg podići automobil mase 1500 kg?

$$S_2 = 20 \cdot S_1$$

$$m_1 = 80 \text{ kg}$$

$$m_2 = 1500 \text{ kg}$$

$$F_1 = m_1 \cdot g$$

$$F_1 = 80 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

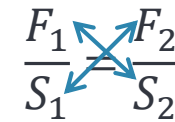
$$F_1 = 800 \text{ N}$$

$$F_A = m_2 \cdot g$$

$$F_A = 1500 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$$

$$F_A = 15\,000 \text{ N}$$

$$p_1 = p_2$$


$$\frac{F_1}{S_1} = \frac{F_2}{S_2}$$

$$F_1 \cdot S_2 = F_2 \cdot S_1$$

$$F_2 = \frac{F_1 \cdot S_2}{S_1}$$

$$F_2 = \frac{800 \text{ N} \cdot 20 \cdot S_1}{S_1}$$

$$F_2 = 16\,000 \text{ N}$$

$$F_2 > F_A$$

Može podići automobil.

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4. Kolikom silom treba delovati na manji klip hidraulične prese površine  $50 \text{ cm}^2$  da bi izlomila kamen? Kamen se lomi ako na njega deluje sila od  $5 \text{ kN}$ . Površina većeg klipa je  $10 \text{ dm}^2$ .

$$S_1 = 50 \text{ cm}^2$$

$$F_2 = 5 \text{ kN} = 5 \cdot 1000 \text{ N} = 5000 \text{ N}$$

$$S_2 = 10 \text{ dm}^2 = 10 \cdot 100 \text{ cm}^2 = 1000 \text{ cm}^2$$

$$p_1 = p_2$$


$$F_1 \cdot S_2 = F_2 \cdot S_1$$

$$F_1 = \frac{F_2 \cdot S_1}{S_2}$$

$$F_1 = \frac{5000 \text{ N} \cdot 50 \text{ cm}^2}{1000 \text{ cm}^2}$$

$$F_1 = \frac{250\,000 \text{ N cm}^2}{1000 \text{ cm}^2}$$

$$F_1 = 250 \text{ N}$$