

Poluga

Sažetak primjeri i zadaci

Sažetak:

Poluga je alat pomoću kojeg manjom silom savladavamo veću.

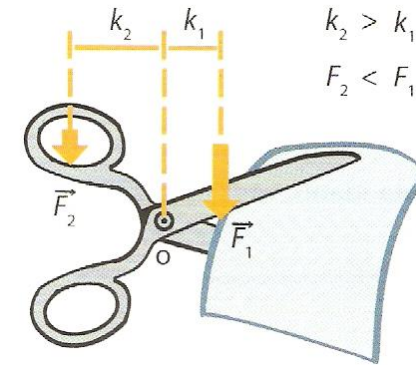
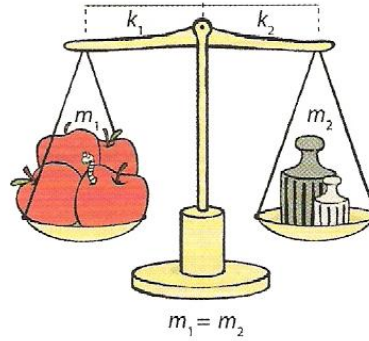
Sila (F) i karak sile (l) su obrnuto proporcionalne veličine, tj. na većem kraku djeluje manja sila.

Postoje dvije vrste poluga: dvostrane i jednostrane.

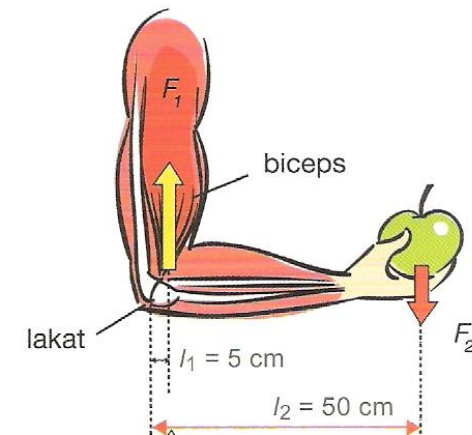
Na principu dvostrane poluge radi klackalica, vaga, škare.

Na principu jednostrane poluge radi tačka, pinceta, ruka.

Dvostrana poluga:

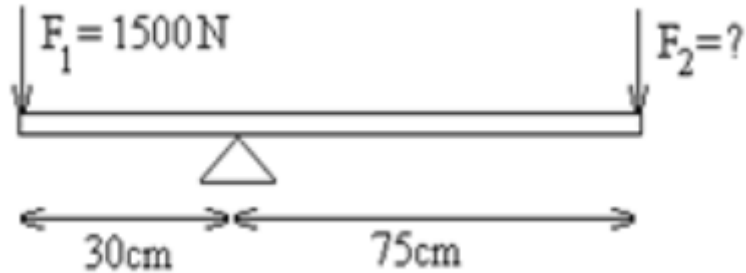


Jednostrana poluga:



Primjeri:

1. Ispiši podatke te izračunaj nepoznatu silu.



$$l_1 = 30\text{ cm}$$

$$F_1 = 1500\text{ N}$$

$$l_2 = 75\text{ cm}$$

$$F_2 = ?$$

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

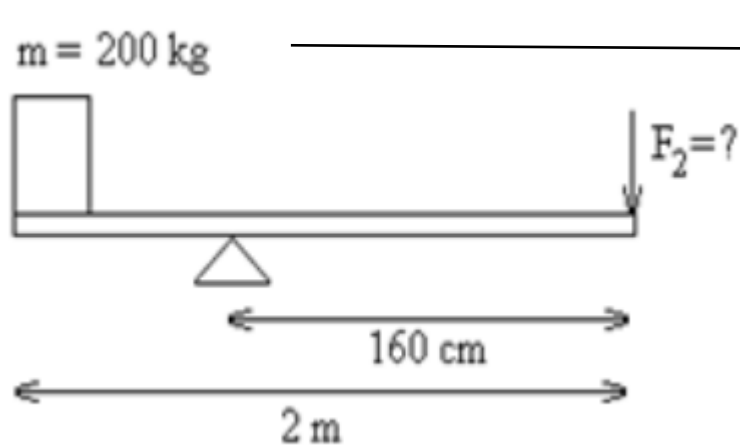
$$1500\text{ N} \cdot 30\text{ cm} = F_2 \cdot 75\text{ cm}$$

$$45\,000\text{ Ncm} = F_2 \cdot 75\text{ cm}$$

$$F_2 = \frac{45\,000\text{ Ncm}}{75\text{ cm}} = 600\text{ N}$$

Primjeri:

2. Ispiši podatke te izračunaj nepoznatu silu.



$$F_1 = m \cdot g = 200 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 2000 \text{ N}$$

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

$$2000 \text{ N} \cdot 40 \text{ cm} = F_2 \cdot 160 \text{ cm}$$

$$80\,000 \text{ Ncm} = F_2 \cdot 160 \text{ cm}$$

$$F_2 = \frac{80\,000 \text{ Ncm}}{160 \text{ cm}} = 500 \text{ N}$$

$$F_1 = 2000 \text{ N}$$

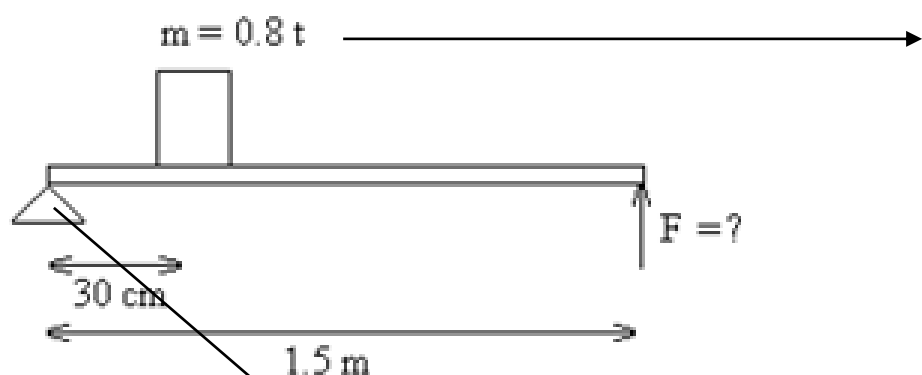
$$l_1 = 40 \text{ cm}$$

$$l_2 = 160 \text{ cm}$$

$$F_2 = ?$$

Primjeri:

3. Ispiši podatke te izračunaj nepoznatu silu.



$$F_1 = m \cdot g = 800 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 8\,000 \text{ N}$$

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

$$8\,000 \text{ N} \cdot 30 \text{ cm} = F_2 \cdot 150 \text{ cm}$$

$$240\,000 \text{ Ncm} = F_2 \cdot 150 \text{ cm}$$

$$F_2 = \frac{240\,000 \text{ Ncm}}{150 \text{ cm}} = 1600 \text{ N}$$

$$F_1 = 8\,000 \text{ N}$$

$$l_1 = 30 \text{ cm}$$

$$l_2 = 150 \text{ cm}$$

$$F_2 = ?$$

Oslonac je na kraju a krak se uvijek računa od oslonca.

Zadaci:

1. Precrtaj sliku, ispiši podatke te izračunaj nepoznatu silu.

