

MEHAMIČKI RAD

ZADACI
prvi deo

$$A = F \cdot S$$

$$a = \frac{\Delta v}{t}$$

$$v_{sr} = \frac{v + v_0}{2}$$

$$s = v_{sr} \cdot t$$

$$A_R = F_R \cdot s$$

$$F_R = F_v - F_{tr}$$

MEHANIČKI RAD

zadaci

1. Koliki rad izvrši sila od 50N koja deluje u pravcu i smeru kretanja tela, ako je telo pod dejstvom ove sile prešlo put 20 dm?

$$F = 50N$$

$$S = 20dm = 20 : 10m = 2m$$

$$A = ?$$

$$A = F \cdot S$$

$$A = 50N \cdot 2m$$

$$A = 100J$$

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2. Na telo deluje vučna sila 30N i sila trenja 5N. Koliki je rad rezultujuće sile na putu 3m?

$$F_v = 30N$$

$$F_{tr} = 5N$$

$$S = 3m$$

$$A_R = ?$$

$$F_R = F_v - F_{tr}$$

$$F_R = 30N - 5N$$

$$F_R = 25N$$

$$A_R = F_R \cdot S$$

$$A_R = 25N \cdot 3m$$

$$A_R = 75J$$

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3. Sara je gurala kolica 5 m i pri tome izvšila rad 40J. Kolikom je silom Sara gurala kolica?

$$S = 5m$$

$$A = 40J$$

$$F = ?$$

$$A = F \cdot S$$

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

$$F = \frac{40J}{5m}$$

$$F = 8N$$

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4. Na telo mase 2 kg deluje sila koja mu saoptava ubrzanje $1,5 \frac{\text{m}}{\text{s}^2}$. Koliki rad izvrši ta sila na putu 13m ?

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

$$a = 1,5 \frac{\text{m}}{\text{s}^2}$$

$$S = 13\text{m}$$

$$A = ?$$

$$F = m \cdot a$$

$$F = 2\text{kg} \cdot 1,5 \frac{\text{m}}{\text{s}^2}$$

$$F = 3\text{N}$$

$$A = F \cdot S$$

$$A = 3\text{N} \cdot 13\text{m}$$

$$A = 39\text{J}$$

MEHAMIČKI RAD

ZADACI
drugi deo

$$F_R = F_v - F_{tr}$$

$$a = \frac{\Delta v}{t}$$

$$A = F \cdot S$$

$$v_{sr} = \frac{v + v_0}{2}$$

$$s = v_{sr} \cdot t$$

$$A_R = F_R \cdot s$$

MEHANIČKI RAD

zadaci

5. Za 5 sekundi telo promeni brzino od $7 \frac{m}{s}$ na $13 \frac{m}{s}$. Koliki je rad vučne sile ako je masa tela 500g?

$$t = 5s$$

$$v_0 = 7 \frac{m}{s}$$

$$v = 13 \frac{m}{s}$$

$$m = 500g = 0,5kg$$

$$A = ?$$

$$a = \frac{\Delta v}{t}$$

$$a = \frac{v - v_0}{t}$$

$$a = \frac{13 \frac{m}{s} - 7 \frac{m}{s}}{5s}$$

$$a = \frac{6 \frac{m}{s}}{5s}$$

$$a = 1,2 \frac{m}{s^2}$$

$$F = m \cdot a$$

$$F = 0,5kg \cdot 1,2 \frac{m}{s^2}$$

$$F = 0,6N$$

$$v_{sr} = \frac{v + v_0}{2}$$

$$v_{sr} = \frac{13 \frac{m}{s} + 7 \frac{m}{s}}{2} = \frac{20 \frac{m}{s}}{2}$$

$$v_{sr} = 10 \frac{m}{s}$$

$$S = v_{sr} \cdot t$$

$$S = 10 \frac{m}{s} \cdot 5s$$

$$S = 50m$$

$$A = F \cdot S$$

$$A = 0,6N \cdot 50m$$

$$A = 30J$$

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6. Biciklista se kretao brzinom $10 \frac{m}{s}$ kada je prestao da okreće pedale i zaustavio se nakon 50s. Koliki rad će izvršiti vučna sila, a koliki sila trenja? Masa bicikla sa biciklistom je 50kg.



$$A_v = F_v \cdot S$$

$$A_v = 0N \cdot S$$

$$A_v = 0J$$

$$v_0 = 10 \frac{m}{s}$$

$$v = 0 \frac{m}{s}$$

$$t = 50s$$

$$m = 50kg$$

$$F_R = \cancel{F_v} - F_{tr}$$

$$F_R = F_{tr}$$

$$F_R = F_{tr}$$

$$m \cdot a = F_{tr}$$

$$50kg \cdot 0,2 \frac{m}{s^2} = F_{tr}$$

$$F_{tr} = 10N$$

$$a = \frac{\Delta v}{t} = \frac{v_0 - v}{t} = \frac{10 \frac{m}{s} - 0 \frac{m}{s}}{50s} = \frac{10 \frac{m}{s}}{50s} = 0,2 \frac{m}{s^2}$$

$$S = v_0 \cdot t - \frac{a \cdot t^2}{2} = 10 \frac{m}{s} \cdot 50s - \frac{0,2 \frac{m}{s^2} \cdot (50s)^2}{2}$$

$$S = 500m - \frac{500m}{2} = 500m - 250m = 250m$$

$$A_{tr} = -F_{tr} \cdot S$$

$$A_{tr} = -10N \cdot 250m$$

$$A_{tr} = -2500J$$

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7. Koliki rad izvrši sila teže na telu mase 0,2kg koje slobodno pada iz mirovanja 3s?

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

$$t = 3\text{s}$$

$$A_t = ?$$

$$F_t = m \cdot g$$

$$F_t = 0,2\text{kg} \cdot 10 \frac{\text{m}}{\text{s}^2}$$

$$F_t = 2\text{N}$$

$$h = \frac{g \cdot t^2}{2} = \frac{10 \frac{\text{m}}{\text{s}^2} \cdot (3\text{s})^2}{2} = \frac{10 \frac{\text{m}}{\text{s}^2} \cdot 9\text{s}^2}{2} = \frac{90\text{m}}{2} = 45\text{m}$$

$$A_t = F_t \cdot h$$

$$A_t = 2\text{N} \cdot 45\text{m}$$

$$A_t = 90\text{J}$$