

# PRIPREMA - Energija (rešenja)

$$\textcircled{1} \quad m = 1,5 \text{ kg} \\ h = 2 \text{ m} \quad (h = s)$$

$$W = ?$$

$$W = F \cdot s$$

$$W = m \cdot g \cdot s$$

$$W = 1,5 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 2 \text{ m}$$

$$W = 30 \text{ J}$$

$$\textcircled{2} \quad W = 4 \text{ kJ} = 4000 \text{ J} \\ s = 2 \text{ m}$$

$$F = ?$$

$$W = F \cdot s$$

$$F = \frac{W}{s}$$

$$F = \frac{4000 \text{ J}}{2 \text{ m}}$$

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

$$\textcircled{3} \quad F = 90 \text{ N} \\ W = 4,5 \text{ kJ} = 4500 \text{ J}$$

$$s = ?$$

$$W = F \cdot s$$

$$s = \frac{W}{F}$$

$$s = \frac{4500 \text{ J}}{90 \text{ N}}$$

$$s = 50 \text{ m}$$

$$\textcircled{4} \quad m = 5000 \text{ g} = 5 \text{ kg} \\ s = 5 \text{ m}$$

$$\mu = 5\% = 0,05$$

a) silu trenja

b)  $W = ?$

$$W = F_{\text{tr}} \cdot s$$

$$W = \mu \cdot m \cdot g \cdot s$$

$$W = 0,05 \cdot 5 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 5 \text{ m}$$

$$W = 12,5 \text{ J}$$

$$\textcircled{5} \quad t = 3 \text{ min} = 180 \text{ s}$$

$$W = 360 \text{ kJ} = 360\,000 \text{ J}$$

$$P = ?$$

$$P = \frac{W}{t} = \frac{360\,000 \text{ J}}{180 \text{ s}} = 2000 \text{ W}$$

$$\textcircled{7} \quad P = 5 \text{ kW} = 5000 \text{ W}$$

$$G = 3,6 \text{ kN} = 3600 \text{ N}$$

$$t = 4 \text{ min} = 240 \text{ s}$$

$$h = ? \quad (h = s) \quad (F = G)$$

$$P = \frac{W}{t}$$

$$W = P \cdot t = 5000 \text{ W} \cdot 240 \text{ s} = 120\,000 \text{ J}$$

$$W = F \cdot s$$

$$s = \frac{W}{F} = \frac{120\,000 \text{ J}}{3600 \text{ N}}$$

$$s = 33,3 \text{ m}$$

$$\textcircled{6} \quad G = 6 \text{ kN} = 6000 \text{ N} \quad (F = G)$$

$$h = 10 \text{ m} \quad (h = s)$$

$$t = 2 \text{ min} = 120 \text{ s}$$

$$P = ?$$

$$W = F \cdot s = 6000 \text{ N} \cdot 10 \text{ m}$$

$$W = 60\,000 \text{ J}$$

$$P = \frac{W}{t} = \frac{60\,000 \text{ J}}{120 \text{ s}}$$

$$P = 500 \text{ W}$$

8.)  $P = 360 \text{ W}$   
 $m = 0,24 \text{ t} = 240 \text{ kg}$   
 $h = 3 \text{ dm} = 0,3 \text{ m}$

$t = ? \quad (h = s)$

$W = F \cdot s$

$W = m \cdot g \cdot s$

$W = 240 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 0,3 \text{ m}$

$W = 720 \text{ J}$

$P = \frac{W}{t} \rightarrow t = \frac{W}{P}$

$t = \frac{W}{P} = \frac{720 \text{ J}}{360 \text{ W}} = 2 \text{ s}$

10.)  $m = 600 \text{ g} = 0,6 \text{ kg}$   
 $h = 10 \text{ m}$

a)  $E_{gp} = ? \quad E_{uk} = E_{gp} + E_k, E_k = 0 \text{ J}$  b) trenutak prije udarca lopte o tlo :

$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 0,6 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 10 \text{ m}$

$E_{gp} = 60 \text{ J}$

$E_{gp} \rightarrow E_k$

$E_k = E_{gp} = 60 \text{ J}$   
 (na max visini)

c)  $h_1 = \frac{1}{2} h = 5 \text{ m}$

$E_k = ?$

$E_{uk} = E_k + E_{gp}$

na pola visine:  $E_k = E_{gp}$

$E_{gp_1} = m \cdot g \cdot h_1$

$E_{gp_1} = 0,6 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 5 \text{ m}$

$E_{gp_1} = 30 \text{ J} \quad E_k = 30 \text{ J}$

d)  $h_2 = 20 \text{ dm} = 2 \text{ m}$

$E_{gp_2} = ? \quad E_{k_2} = ?$

$E_{uk} = E_{gp_2} + E_{k_2} \quad (E_{uk} = 60 \text{ J})$

$E_{uk} = m \cdot g \cdot h_2 + E_{k_2}$

$60 \text{ J} = 0,6 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 2 \text{ m} + E_{k_2}$

$60 \text{ J} = 12 \text{ J} + E_{k_2}$

$E_{k_2} = 60 \text{ J} - 12 \text{ J}$

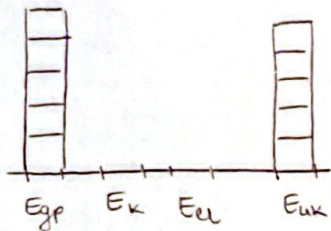
$E_{k_2} = 48 \text{ J}$

$E_{gp_2} = m \cdot g \cdot h_2$

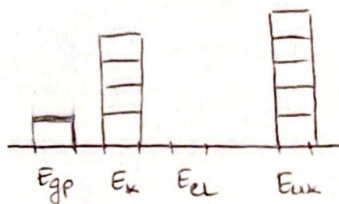
$E_{gp} = 0,6 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 2 \text{ m}$

$E_{gp} = 12 \text{ J}$

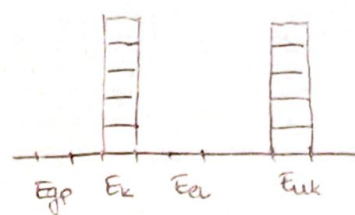
e)  $E_{uk} = E_{gp} + E_k$   
 $E_{uk} = E_{gp} \text{ (max)} \quad E_k = 0 \text{ J}$   
 početni trenutak



$E_{uk} = E_{gp} + E_k$   
 $E_{gp} = 12 \text{ J} \quad E_k = 48 \text{ J}$   
 srednji trenutak



$E_{uk} = E_{gp} + E_k$   
 $E_{uk} = E_k \text{ (max)} \quad E_{gp} = 0 \text{ J}$   
 konačni trenutak



11.)  $P = 5000 \text{ W}$   
 $V = 10 \text{ m}^3$   
 $h = 20 \text{ m}$   


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 $t = ?$

$\rho = \frac{m}{V} \quad m = \rho \cdot V$

$m = 1000 \frac{\text{kg}}{\text{m}^3} \cdot 10 \text{ m}^3$

$m = 10000 \text{ kg}$

$F = m \cdot g$

$F = 10000 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}}$

$F = 100000 \text{ N}$

$W = F \cdot h$

$W = 100000 \text{ N} \cdot 20 \text{ m}$

$W = 2000000 \text{ J}$

$P = \frac{W}{t}$

$t = \frac{W}{P}$

$t = \frac{2000000 \text{ J}}{5000 \text{ W}}$

$t = 400 \text{ s}$

12.)  $m = 400 \text{ dag} = 0,4 \text{ kg}$   
 $h = 3 \text{ m}$   


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$E_{gp} = ?$

$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 0,4 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 3 \text{ m}$

$E_{gp} = 12 \text{ J}$

13.)  $m = 0,5 \text{ kg}$   
 $h = 150 \text{ cm} = 1,5 \text{ m}$   


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a)  $E_{gp} = ?$

$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 0,5 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 1,5 \text{ m}$

$E_{gp} = 7,5 \text{ J}$

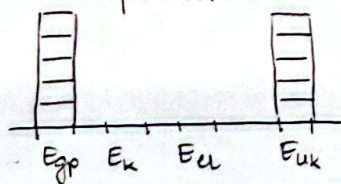
b)  $E_{gp} \rightarrow E_k$

$E_k = 7,5 \text{ J}$

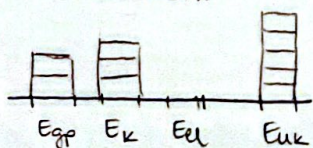
14.)  $m = 25 \text{ kg}$   
 $h_1 = 7 \text{ dm} = 0,7 \text{ m}$   
 $h_2 = 150 \text{ cm} = 1,5 \text{ m}$   


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a) početni



konačni



b) u točki kada je najviše udaljena od tla.

c)  $E_{gp1} = m \cdot g \cdot h_1 = 25 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 0,7 \text{ m} = 175 \text{ J}$

d)  $E_{uk} = E_{k1} + E_{gp1}$  (za najnižu točku)

$E_{uk} = E_{k2} + E_{gp2} = E_{gp2}$  jer je  $E_{k2} = 0 \text{ J}$   
 (za najvišu točku)

$E_{uk} = E_{gp2} = m \cdot g \cdot h_2 = 25 \text{ kg} \cdot 10 \frac{\text{N}}{\text{kg}} \cdot 1,5 \text{ m} = 375 \text{ J}$

$E_{uk} = E_{k1} + E_{gp2}$

$E_{k1} = E_{uk} - E_{gp2} = 375 \text{ J} - 175 \text{ J} = 200 \text{ J}$

$$\textcircled{15} \quad h = 30 \text{ cm} = 0,3 \text{ m}$$

$$E_{\text{gp}} = 30 \text{ J}$$

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$$m = ?$$

$$E_{\text{gp}} = m \cdot g \cdot h$$

$$m = \frac{E_{\text{gp}}}{g \cdot h}$$

$$m = \frac{30 \text{ J}}{10 \frac{\text{N}}{\text{kg}} \cdot 0,3 \text{ m}}$$

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

$\textcircled{16}$  Odradeno na satu!