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# Slobodan pad - zadaci

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# SLOBODAN PAD – zadaci –

1. Telo slobodno pada. Kolika je brzina tela nakon 5 s? Koliki put je telo prešlo za to vreme?

$$t = 5s$$

$$v = ?$$

$$h = ?$$

$$g = 10 \frac{m}{s^2}$$

$$v = g \cdot t$$

$$v = 10 \frac{m}{s^2} \cdot 5s$$

$$v = 50 \frac{m}{s}$$

$$h = \frac{g \cdot t^2}{2}$$

$$h = \frac{10 \frac{m}{s^2} \cdot (5s)^2}{2}$$

$$h = \frac{10 \frac{m}{s^2} \cdot 25 s^2}{2}$$

$$h = 125 m$$

# SLOBODAN PAD – zadaci –

2. Kamen slobodno pada i neposredno pre udara u tlo ima brzinu  $15 \frac{m}{s}$ . Koliko je dugo kamen padao? Sa koje visine je pao kamen?

$$v = 15 \frac{m}{s}$$

$$t = ?$$

$$h = ?$$

$$g = 10 \frac{m}{s^2}$$

$$v = g \cdot t$$

$$t = \frac{v}{g}$$

$$t = \frac{15 \frac{m}{s}}{10 \frac{m}{s^2}}$$

$$t = 1,5s$$

$$h = \frac{g \cdot t^2}{2}$$

$$h = \frac{10 \frac{m}{s^2} \cdot (1,5s)^2}{2}$$

$$h = \frac{10 \frac{m}{s^2} \cdot 2,25 s^2}{2}$$

$$h = 11,25 m$$

# SLOBODAN PAD – zadaci –

3. Sa krova koji se nalazi na visini 45 metara otapa se sneg i pada kap vode. Na kojoj visini se nalazi kap vode nakon 2 s kretanja?

$$t = 2s$$

$$h_k = 45m$$

$$g = 10 \frac{m}{s^2}$$

$$h_p = \frac{g \cdot t^2}{2}$$

$$h_p = \frac{10 \frac{m}{s^2} \cdot (2s)^2}{2}$$

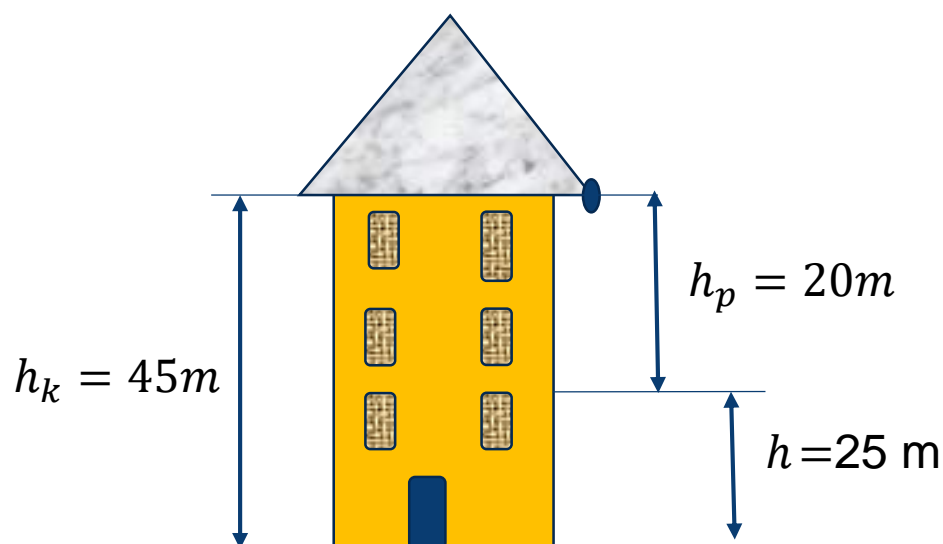
$$h = h_k - h_p$$

$$h = 45 m - 20m$$

$$h_p = \frac{10 \frac{m}{s^2} \cdot 4 s^2}{2}$$

$$h = 25 m$$

$$h_p = 20 m$$



# SLOBODAN PAD – zadaci –

4. Sa koje visine treba da pada telo da bi pri udaru u tlo imalo brzinu  $16\frac{m}{s}$ ?

I način

$$v = 16\frac{m}{s}$$

$$h = ?$$

$$g = 10\frac{m}{s^2}$$

$$v = g \cdot t$$

$$t = \frac{v}{g}$$

$$t = \frac{16\frac{m}{s}}{10\frac{m}{s^2}}$$

$$t = 1,6s$$

$$h = \frac{g \cdot t^2}{2}$$

$$h = \frac{10\frac{m}{s^2} \cdot (1,6s)^2}{2}$$

$$h = \frac{10\frac{m}{s^2} \cdot 2,56 s^2}{2}$$

$$h = 12,8 m$$

II način

$$v^2 = 2 \cdot g \cdot h$$

$$h = \frac{v^2}{2 \cdot g}$$

$$h = \frac{\left(16\frac{m}{s}\right)^2}{2 \cdot 10\frac{m}{s^2}}$$

$$h = \frac{256\frac{m^2}{s^2}}{20\frac{m}{s^2}}$$

$$h = 12,8 m$$

# SLOBODAN PAD – zadaci –

5. Ako je telo slobodno padalo 10s, posle koliko sekundi će se nalaziti na polovini između početnog i krajnjeg položaja?

$$t = 10s$$

$$h = ?$$

$$h_{1/2} = ?$$

$$t_{1/2} = ?$$

$$g = 10 \frac{m}{s^2}$$

$$h = \frac{g \cdot t^2}{2}$$

$$h = \frac{10 \frac{m}{s^2} \cdot (10s)^2}{2}$$

$$h = \frac{10 \frac{m}{s^2} \cdot 100 s^2}{2}$$

$$h = 500 m$$

$$h_{1/2} = \frac{h}{2}$$

$$h_{1/2} = \frac{500 m}{2}$$

$$h_{1/2} = 250 m$$

$$h_{1/2} = \frac{g \cdot t_{1/2}^2}{2}$$

$$t_{1/2}^2 = \frac{2 \cdot h_{1/2}}{g}$$

$$t_{1/2}^2 = \frac{2 \cdot 250 m}{10 \frac{m}{s^2}}$$

$$t_{1/2}^2 = 50s^2$$

$$t_{1/2} = \sqrt{50s^2}$$

$$t_{1/2} \approx 7,07 s$$

# SLOBODAN PAD – zadaci –

6. Telo slobodno pada 5 s. Koliki put je prešao u poslednjoj sekundi?

$$t = 5s$$

$$h = \frac{g \cdot t^2}{2}$$

$$h_5 = \frac{10 \frac{m}{s^2} \cdot (5s)^2}{2}$$

$$h_4 = \frac{10 \frac{m}{s^2} \cdot (4s)^2}{2}$$

$$h = h_5 - h_4$$

$$h = 125 m - 80m$$

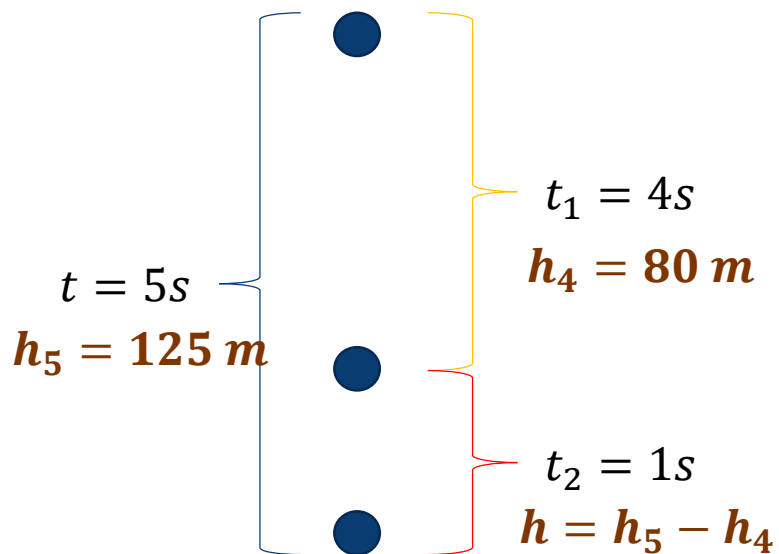
$$h_5 = \frac{10 \frac{m}{s^2} \cdot 25 s^2}{2}$$

$$h_4 = \frac{10 \frac{m}{s^2} \cdot 16 s^2}{2}$$

$$h = 45 m$$

$$h_5 = 125 m$$

$$h_4 = 80 m$$



# SLOBODAN PAD – zadaci –

7. Telo slobodno pada sa visine 180 m. Koliko iznose pređeni putevi u prvoj trećini vremena, u drugoj trećini vremena i u trećoj trećini vremena?

$$h = 180 \text{ m}$$

$$h = \frac{g \cdot t^2}{2}$$

$$t_1 = t_2 = t_3 = \frac{t}{3} = \frac{6s}{3} = 2s$$

$$t^2 = \frac{2 \cdot h}{g}$$

$$h_2 = \frac{10 \frac{\text{m}}{\text{s}^2} \cdot (2s)^2}{2}$$

$$h_4 = \frac{10 \frac{\text{m}}{\text{s}^2} \cdot (4s)^2}{2}$$

$$t^2 = \frac{2 \cdot 180 \text{ m}}{10 \frac{\text{m}}{\text{s}^2}}$$

$$h_2 = \frac{10 \frac{\text{m}}{\text{s}^2} \cdot 4 \text{ s}^2}{2}$$

$$h_4 = \frac{10 \frac{\text{m}}{\text{s}^2} \cdot 16 \text{ s}^2}{2}$$

$$t^2 = 36s^2$$

$$h_2 = 20 \text{ m}$$

$$h_4 = 80 \text{ m}$$

$$t = \sqrt{36s^2}$$

$$h_I = h_2 = 20 \text{ m}$$

$$h_{II} = h_4 - h_2 = 80 \text{ m} - 20 \text{ m} = 60 \text{ m}$$

$$h_{III} = h - h_4 = 180 \text{ m} - 80 \text{ m} = 100 \text{ m}$$

$$t = 6 \text{ s}$$

