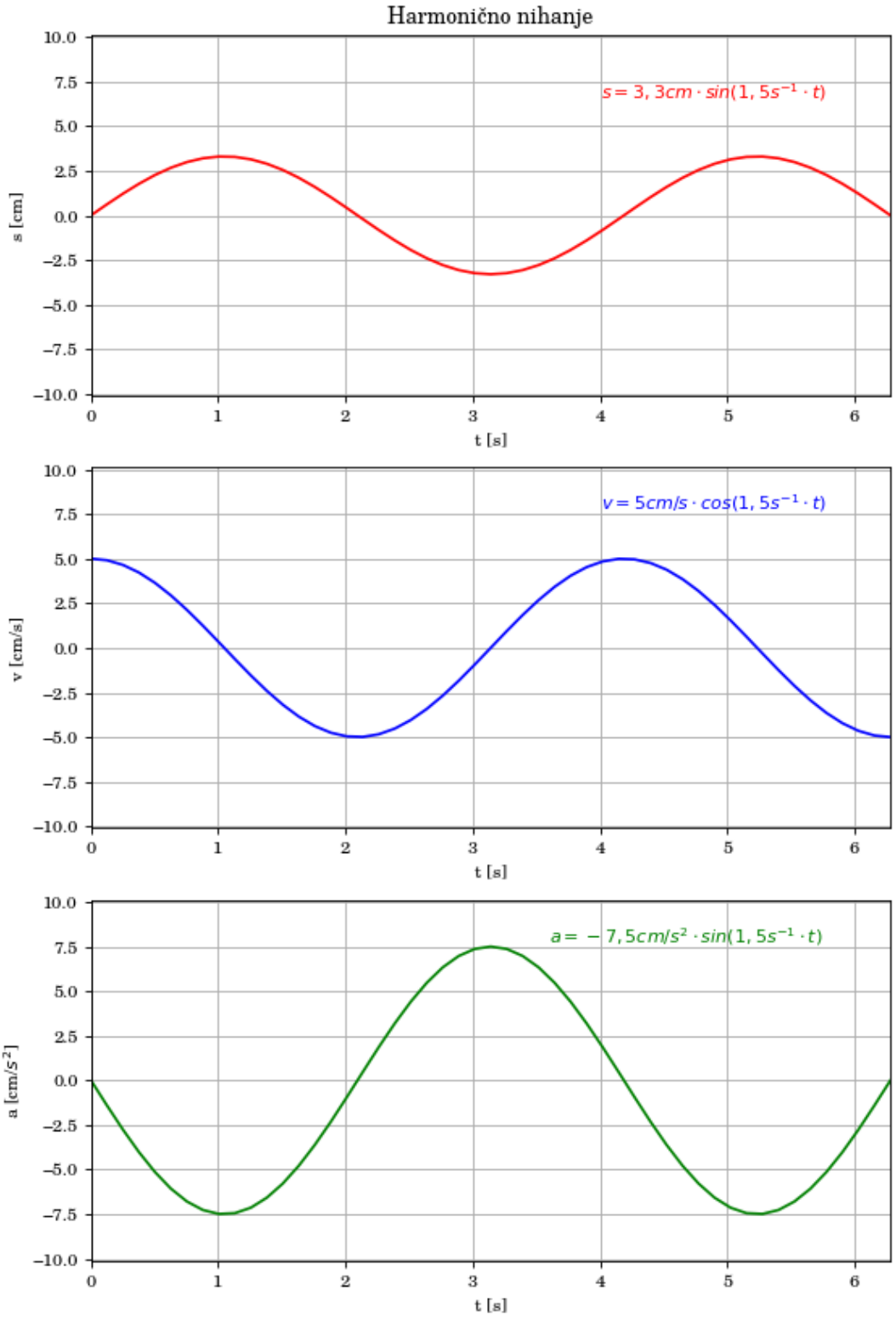
REŠITVE UČNEGA LISTA NIHANJE, NIHALA

(1) Naloga



Račun:
$v_0 = 5m/s$
$\omega = 1,5s^{-1}$
$- - - - - - -$
$t_0 = ?$
$s_0 = ?$
$a_0 = ?$

$\omega = 2\pi\nu = 2\pi\frac{1}{t_0} \Rightarrow t_0 = \frac{2\pi}{\omega} = 4,2s$

$v_0 = s_0\omega \Rightarrow s_0 = \frac{v_0}{\omega} = 3,33cm$

$a_0 = s_0\omega^2 = 7,5cm/s^2$

(2) Naloga

$t_0 = 0,5s$
$\nu = \frac{1}{t_0} = 2Hz$
$t_0 = 2\pi\sqrt{\frac{l}{g}} \Rightarrow l = (\frac{t_0}{2\pi})^2 \cdot g = 0,06m$

(3) Naloga

$s_0 = 5cm = 0,05m$
$\nu = 10Hz$
$- - - - - -$
$\omega = 2\pi\nu = 62,8s^{-1}$
$v_0 = s_0\omega = 3,14m/s$
$a_0 = s_0\omega^2 = 197,2m/s^2$
$s(t) = 0,05m \cdot \sin(62,8s^{-1} \cdot t) \Rightarrow s(4s) = 0,05m \cdot \sin(62,8s^{-1} \cdot 4s) = -0,006m$

(4) Naloga $s_0 = 30cm = 0,3m$

$v_0 = 13m/s$
$- - - - -$
$v_0 = s_0\omega = s_0 2\pi\nu = s_0 2\pi\frac{1}{t_0} \Rightarrow t_0 = \frac{2\pi s_0}{v_0} = 0,15s$

(5) Naloga Popravek: Nitno nihalo z maso uteži 4 kg ima dolžino 6 m.

$m = 4kg$
$l = 6m$
$x = 20cm = 0,2m$
$h = 5cm = 0,05m$
$- - - -$
$t_0 = 2\pi\sqrt{\frac{l}{g}} = 4,91s$
$s_0 = \sqrt{(6m)^2 - (5,8m)^2} = 1,54m$
$v_0 = s_0\omega = 2\pi\nu = 2\pi\frac{1}{t_0} = 1,97m/s$
$W = \frac{mv_0^2}{2} = mgx = 7,76J$
$W_k = W - W_p = W - mgh = 5,8J$

(6) Naloga

$s_0 = 0,2m$
$t_0 = 2s$
$- - - -$
$v_0 = s_0\omega = s_0 2\pi \frac{1}{t_0} = 0,63m/s$

(7) Naloga

$t_0 = 1s$
$- - - -$
$t_0 = 2\pi\sqrt{\frac{l}{g}} \Rightarrow l = (\frac{t_0}{2\pi})^2 \cdot g = 0,25m$

(8) Naloga

$k = 2N/cm = 200N/m$
$t_0 = 0,5s$
$- - - -$
$t_0 = 2\pi\sqrt{\frac{m}{k}} \Rightarrow m = (\frac{t_0}{2\pi})^2 \cdot k = 1,27kg$

(9) Naloga

$t = 0,25s$
$k = 15N/m$
$- - - -$
$t_0 = 0,5s$
$\nu = \frac{1}{t_0} = 2Hz$
$t_0 = 2\pi\sqrt{\frac{m}{k}} \Rightarrow m = (\frac{t_0}{2\pi})^2 \cdot k = 0,1kg$

(10) Naloga

$m = 10g = 0,01kg$
$\nu = 2Hz$
$s_0 = 2cm = 0,02m$
$- - - -$
$v = s_0\omega = s_0 2\pi\nu = 0,25m/s$
$a = 0m/s^2$
$\nu = \frac{1}{t_0} \Rightarrow t_0 = \frac{1}{\nu} = 0,5s$
$t_0 = 2\pi\sqrt{\frac{m}{k}} \Rightarrow k = (\frac{2\pi}{t_0})^2 \cdot m = 1,58kg$