

NIHANJE

HARMONIČNO NIHANJE

$$\nu = \frac{N}{t} = \frac{1}{t_0}$$

$$\omega = \frac{2\pi}{t_0} = 2\pi\nu$$

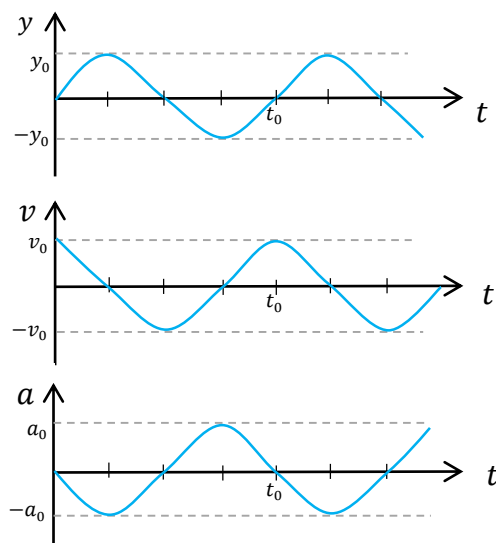
amplituda hitrosti: $v_0 = \omega \cdot y_0$

amplituda pospeška: $a_0 = \omega^2 \cdot y_0$

$$y(t) = y_0 \cdot \sin(\omega \cdot t)$$

$$v(t) = v_0 \cdot \cos(\omega \cdot t)$$

$$a(t) = -a_0 \cdot \sin(\omega \cdot t)$$



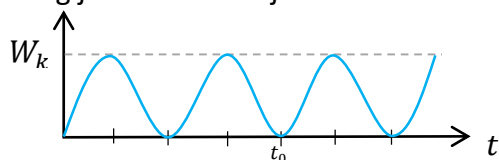
NITNO/MATEMATIČNO NIHALO

$$t_0 = 2\pi \cdot \sqrt{\frac{l}{g}}$$

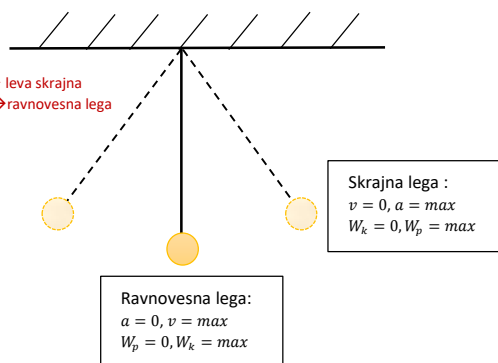
$$W_k = \frac{mv^2}{2}$$

$$W_p = W_k$$

Energija niha 2x hitreje kot nihalo.



1 nihaj: ravnoesna lega → leva skrajna
lega → desna skrajna lega → ravnoesna lega



VZMETNO NIHALO

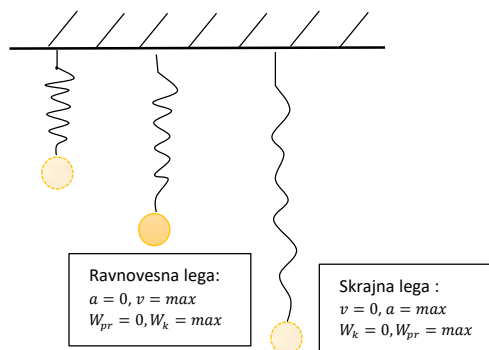
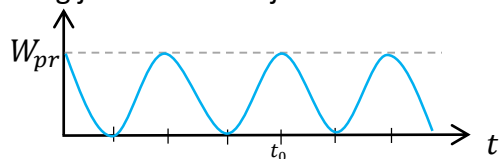
$$t_0 = 2\pi \cdot \sqrt{\frac{m}{k}}$$

$$W_{pr} = \frac{kx^2}{2}$$

$$F = m \cdot g = k \cdot x$$

$$W_{pr} = W_k$$

Energija niha 2x hitreje kot nihalo.

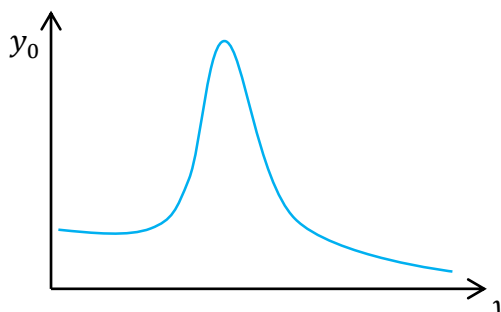


VSILJENO NIHANJE IN RESONANCA

Nihalo je v resonanci, ko mu vsiljujemo nihanje s frekvenco, ki je enaka njegovi lastni frekvenci.

$$\nu_{nit} = \frac{1}{2\pi} \cdot \sqrt{\frac{g}{l}}$$

$$\nu_{vzm} = \frac{1}{2\pi} \cdot \sqrt{\frac{k}{m}}$$



DUŠENO NIHANJE

Zaradi energijskih izgub je nihanje dušeno, amplituda nihala se zmanjšuje s časom, in to tem hitreje, čim močnejše je dušenje.

