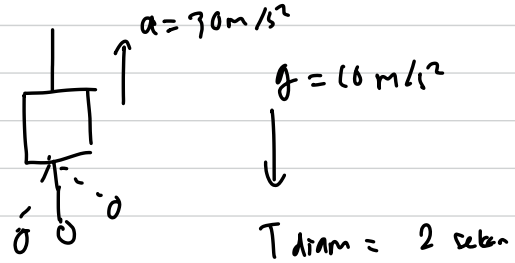
Latihan Soal 2

Qornain Aji
21/TK/481767/53170

1



T diam = 2 sekon

Tentukan periode ayunan saat lift gerak!

$$T_{diam} = 2\pi\sqrt{\frac{L}{g}}$$

$$T_{gerak} = 2\pi\sqrt{\frac{L}{a+g}}$$

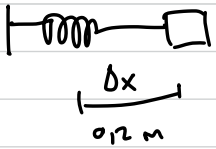
$$\frac{T_{diam}}{T_{gerak}} = \frac{2\pi\sqrt{\frac{L}{g}}}{2\pi\sqrt{\frac{L}{a+g}}}$$

$$\frac{2}{T_{gerak}} = \sqrt{\frac{a+g}{g}} = \sqrt{\frac{a}{g}+1}$$

$$\frac{2}{T_{gerak}} = \sqrt{3+1} = \sqrt{4} = 2$$

$T_{gerak} = 1$ sekon //

2



T = 0,8 s

a. Posisi kotak ketika kecepatan 1.0 m/s

$$\omega = \frac{2\pi}{T} = \frac{2\pi}{0,8} = \frac{20\pi}{8} = \frac{5}{2}\pi$$

$$y = A\cos(\omega t + \theta)$$

$$V = -\omega A \sin(\omega t + \theta)$$

saat $V = 1$ m/s

$$1 = -\frac{5}{2}\pi(0,2)\cos\left(\frac{5}{2}\pi t + \theta\right)$$

$\theta = 0$ karena saat $t = 0$, nilai cos akan maksimum sehingga $\theta = 0$

$$1 = -\frac{1}{2}\pi\cos\left(\frac{5}{2}\pi t\right)$$

$$-\frac{2}{\pi} = \cos\left(\frac{5}{2}\pi t\right)$$

$t = 0,3$ dan $t = 0,5$

Sehingga

$$y = A\cos(\omega t) = 0,2\cos\left(\frac{5}{2}\pi(0,3)\right)$$

$$= -\frac{\sqrt{2}}{10} = -0,141 \text{ m}$$

$$= -0,15 \text{ m}$$ //

b. Hitung Spring Constant

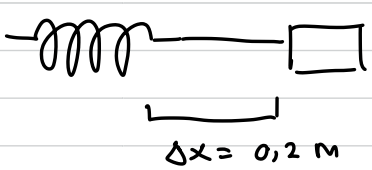
$$f = \frac{\omega}{2\pi} \rightarrow T = \frac{2\pi}{\omega} = 2\pi\cdot\sqrt{\frac{m}{k}}$$

$$T^2 = 4\pi^2\frac{m}{k} \rightarrow k = \frac{4\pi^2 m}{T^2}$$

$$k = \frac{4\pi^2(0,5)}{(0,8)^2} = \frac{4(10)(0,5)}{0,8} \quad \boxed{\pi^2 = 10}$$

$$= \frac{20}{(0,8)^2} = \frac{20}{0,64} = \frac{2000}{64} = 31,25 \frac{N}{m}$$ //

3



Δx = 0,2 m , t = 0 s

Tercipta 15 osilasi pada detik ke 10 s

Tentukan

a) T dari osilasi yg tercipta

15 osilasi dalam 10 detik maka frekuensi

$$= \frac{15}{10} = \frac{3}{2} \text{ Hz}$$

$$f = \frac{1}{T} \rightarrow T = \frac{1}{f} = \frac{2}{3} = 0,667 \text{ s}$$

b) Kecepatan maksimum dari keranjang

$$\omega \cdot A = \frac{2\pi}{T} \cdot A$$

$$= \frac{2\pi \cdot 0{,}2}{0{,}667}$$

$$= 1{,}88 \text{ m/s}$$