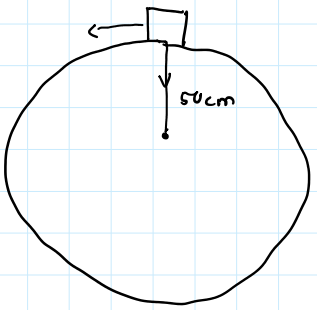
Latihan Soal

Friday, 24 September 2021 16.20

✱ Latihan Soal 1



balok = 0,2 kg
r tali = 0,5 m
f = 75 rpm = $\frac{75}{60}$ rps

a) Kecepatan linier balok

$$\boxed{V_T = \omega \cdot r}$$

$\omega = 2\pi f$

$V_T = 2\pi f \cdot r$

$V_T = 2\pi \cdot \frac{75}{60} \cdot 0,5$

$V_T = 3,926 \ m/s$

b) Tegangan tali (T)

$a_s = \frac{V^2}{R} = \frac{(3,926)^2}{0,5}$

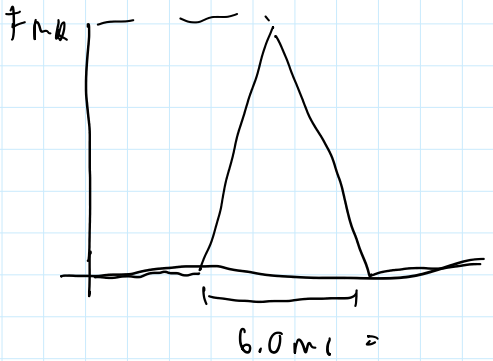
$a_s = 30,826 \ m/s^2$

$\Sigma F = T = m \cdot a_s$
$= 0,2 \cdot 30,826 \ m/s^2$
$= 6,1652 \ N$

✱ Latihan Soal 2

Bola kasti = 0,25 kg jatuh dari tinggi 4 m.

memantul 3.5 m



mencari V_1 saat turun

$$V_f^2 = V_i^2 + 2gh$$

$$V_f = \sqrt{2 \cdot 10 \cdot 4}$$

$$= \sqrt{80} \quad 4\sqrt{5} \quad m/s = 8.944 \; m/s = V_1$$

mencari kecepatan V_2 saat naik

$$V_f^2 = V_i^2 - 2gh$$

$$V_i = \sqrt{2 \cdot 10 \cdot 3.5}$$

$$= \sqrt{70} \quad = 8.366 \quad = m/s = V_2$$

Mencari F_{av}

$$I = \Delta P = F \cdot \Delta t = m(V_2 - V_1)$$

$$F_{av} = \frac{\Delta P}{\Delta t} = \frac{0{,}25\left((-8.366) - 8.944\right)}{6 \cdot 10^{-3}}$$

$$= -721.25 \; N$$

Mencari F_{max}

$$I = \text{luas area} = \frac{1}{2} F_{max} \Delta t = \Delta P$$

$$2 \frac{\Delta P}{\Delta t} = F_{max}$$

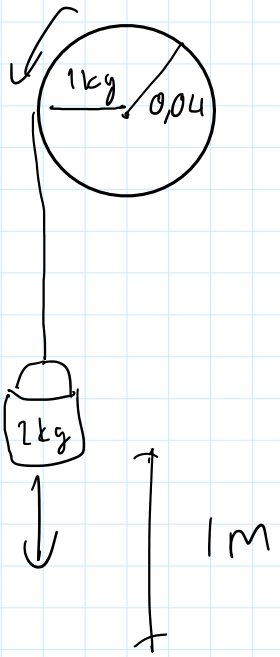
$$2(-721.25) = F_{max}$$

$$-1442.5\,N = F_{max}$$

$=$

※ Latihan Soal 3

Ember = 2kg dikaitkan tali pada katrol silinder $r = 4\,cm = 0,04\,m$
m silinder = 1 kg



berapa besar ay translasi vertikal

$$F \cdot R = I \cdot \alpha$$

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$$F = \frac{I\,\alpha}{R} = \frac{\frac{1}{2} m R^2 \cdot \alpha}{R} = \frac{1}{2} m R \alpha = T$$

$$T = m_{\text{ember}} \cdot g = \frac{1}{2} \cdot m_{\text{silinder}} \cdot R \cdot \frac{a_y}{R}$$

* $\Sigma F = m \cdot a$

$$W - T = m \cdot a_y$$

$$W - \frac{1}{2} m_{\text{silinder}} \cdot a_y = (m_{\text{ember}}) a_y$$

$$W = (m_{\text{ember}} \quad\quad) a_y + \frac{1}{2} m_{\text{silinder}} \cdot a_y$$

$$2 \cdot 10 = (\quad) a_y + 0{,}5\, a_y$$

$$20 = 3{,}5\, a_y$$

$$\frac{20}{2+0{,}5} = \frac{20}{\frac{45}{2}} \quad \frac{2\pi}{T} = \text{rad/s}$$