

#KUI8 1

No. 801010  
Date 8-OKT-2024

$$\textcircled{1} \quad u = 3t - 4t^2 + t^3$$

u (meter) &amp; t (detik)

Dit: posisi obek!

a. waktunya  $t = 1\text{s}$ 

$t = 2\text{s}$

$t = 3\text{s}$

$t = 4\text{s}$

b. perpindahan obek  $t = 0\text{s}$  &  $t = 4\text{s}$ c. vavg obek  $t = 2\text{s}$  sampai  $t = 4\text{s}$ d. grafik  $u$  terhadap  $t$   $0 \leq t \leq 4$ Jawab: a.  $u = 3t - 4t^2 + t^3$ 

$3(1) - 4(1)^2 + (1)^3$

$= 3 - 4 + 1 = -1 + 1 = 0 \text{ meter}$

$t = 2\text{s}$

$u = 3(2) - 4(2)^2 + (2)^3$

$= 3(2) - 4(4) + 8$

$= 6 - 16 + 8 = -10 + 8 = -2 \text{ meter}$

$t = 3\text{s}$

$u = 3(3) - 4(3)^2 + (3)^3$

$= 9 - 4(9) + 27$

$= 9 - 36 + 27$

$= -27 + 27$

$= 0 \text{ meter}$

$t = 4\text{s}$

$= 3(4) - 4(4)^2 + (4)^3$

$= 12 - 64 + 64 = -52 + 64$

$= 12 \text{ meter}$

$\text{b. } t = 0\text{s}$

$u = 3t - 4t^2 + t^3$

$= 3(0) - 4(0)^2 + (0)^3$

$= 0 - 0 + 0 = 0$

$t = 4\text{s}$

$u = 3(4) - 4(4)^2 + (4)^3$

$= 12 - 4(16) + 64$

$= 12 - 64 + 64$

$= -52 + 64 = 12$

perpindahan:

$\Delta u = u(4) - u(0)$

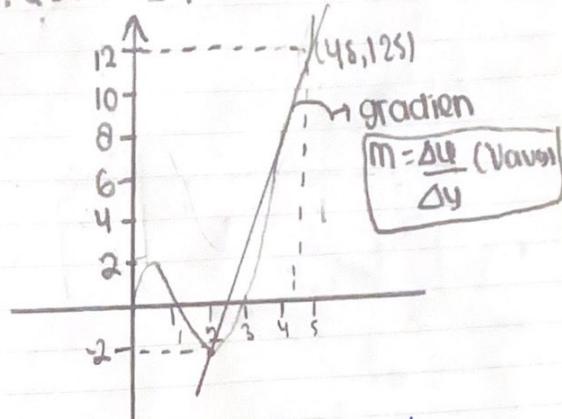
$= 12 - 0 = 12 \text{ meter}$

$c. (1) = 3t - 4t^2 + t^3$

$v_{avg} = \frac{\Delta u}{\Delta t} = \frac{u(4) - u(2)}{4-2}$

$= \frac{12 - (-2)}{2} = \frac{14}{2} = 7 \text{ meter/s}$

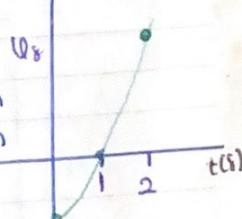
$d. 0 \leq t \leq 4$

 $\textcircled{2} \quad \text{Olik: } a \text{ konstan}$ 

$u_0 = 6 \text{ m}$

Dit: a) besar percepatan

b) arah percepatan

Jawab:  $u(t) = u_0 + v_0 t + \frac{1}{2} a t^2$  [9IB]

$\Leftrightarrow u_0 = v_0 = 0$

$u(t) = \frac{1}{2} a t^2$

$t = 2\text{s} \quad u(t) = 6 \text{ m}$

$6 = \frac{1}{2} a (2)^2 \Leftrightarrow u(t) = \frac{1}{2} a t^2$

$6 = \frac{1}{2} a (4)^2 \Leftrightarrow a = 3 \text{ m/s}^2$

- b) arah positif sumbu  $x$   
 ③ satu benda titik bergerak dgn persamaan:

$$r(t) = \{5t\hat{i} + (31,25 - 5t^2)\hat{j}\} \text{ m}$$

a. Buatlah sketsa lintasan benda!

b Berapakah besar kecepatan benda pada saat  $t = 28$ ?

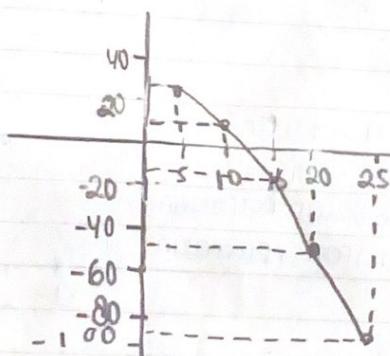
c. Hitunglah vektor kecepatan benda pada saat mencapai  $h = 2,0 \text{ m}$  dari tanah!

djawab:  $r(t) = \underbrace{\{5t\hat{i}\}}_{x} + \underbrace{\{(31,25 - 5t^2)\hat{j}\}}_{y} \text{ m}$

$$x = 5t$$

$$y = (31,25 - 5t^2)$$

$t$	$x$	$y$
1	5	26,25
2	10	11,25
3	15	-13,75
4	20	-48,75
5	25	-93,75



(b)  $t = 28$

$$r(t) = \{5t\hat{i} + (31,25 - 5t^2)\hat{j}\} \text{ m}$$

$$v = \frac{dr}{dt} \quad \downarrow \quad v = \dot{x}\hat{i} + \dot{y}\hat{j} = 5\hat{i} + (-10t)\hat{j} \text{ m/s}$$

$$= \frac{da}{dt} \quad \downarrow \quad a \quad \uparrow \quad a = \dot{v} = v_0 + \int a dt$$

$$v = \frac{d}{dt} \{5t\hat{i} + (31,25 - 5t^2)\hat{j}\}$$

$$= \{5\hat{i} - 10t\hat{j}\}$$

$$= t = 28$$

$$= \{5\hat{i} - 10(28)\hat{j}\} = 5\hat{i} - 20\hat{j} \text{ m/s}$$

$$|v| = \sqrt{5^2 + (20^2)}$$

$$= \sqrt{25 + 400}$$

$$= \sqrt{425} = \sqrt{25 \times 17}$$

$$= 5\sqrt{17} \text{ m/s}$$

c)  $h = 2,0 \text{ m}$

$$y(t) = (31,25 - 5t^2)\hat{j}$$

$$2,0 = (31,25 - 5t^2)\hat{j}$$

$$5t^2 = (31,25)\hat{j} - 2,0$$

$$5t^2 = 29,25 \hat{j}$$

$$t^2 = \frac{29,25}{5} \hat{j}$$

$$t^2 = 5,85 \hat{j}$$

$$t = \sqrt{5,85} \hat{j}$$

$$= 2,41860 \hat{j} \approx 2,42 \hat{j}$$

vektor kecepatan?

$$v(t) = \{5\hat{i} + (-10t)\hat{j}\} \text{ m/s}$$

$$v(2,42) = \{5\hat{i} + (-10 \cdot 2,42)\hat{j}\} \text{ m}$$

$$= 5\hat{i} - (24,2)\hat{j} \text{ m/s}$$

$$v(2,42) = 5\hat{i} - 24,2\hat{j} \text{ m/s}$$

④ Dalam notasi vektor,

$$\begin{aligned} \vec{a} &= (4,0 \text{ m})\hat{i} + (3,0 \text{ m})\hat{j} \\ \vec{b} &= (-13,0 \text{ m})\hat{i} + (7,0 \text{ m})\hat{j} \end{aligned}$$

- a. Berapakah  $\vec{a} + \vec{b}$ ?
- b. Tentukan besaran  $\vec{a} + \vec{b}$ !
- c. Tentukan arah  $\vec{a} + \vec{b}$ !

Jawab:  $\vec{a} + \vec{b}$

$$\begin{aligned} \vec{a} + \vec{b} &= (4,0 \text{ m})\hat{i} + (-13,0 \text{ m})\hat{i} + \\ &\quad (3,0 \text{ m})\hat{j} + (7,0 \text{ m})\hat{j} \\ &= (9,0 \text{ m})\hat{i} + (10,0 \text{ m})\hat{j} \end{aligned}$$

$$\begin{aligned} b) |\vec{a} + \vec{b}| &= \sqrt{(9,0 \text{ m})^2 + (10,0 \text{ m})^2} \\ &= \sqrt{181 \text{ m}^2} = 13,45 \text{ m} \end{aligned}$$

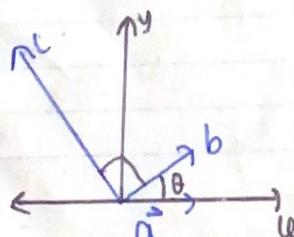
c) arah  $\vec{a} + \vec{b}$ ?

$$\theta = \tan^{-1} \left( \frac{10,0}{-9} \right)$$

$$\approx 48,0^\circ$$

$$\begin{aligned} \text{jarak arah} &= 180^\circ - 48^\circ \\ &= 132^\circ \text{ terhadap sumbu } u \end{aligned}$$

$$\begin{aligned} ⑤ a &= 3,00 \text{ m} \\ b &= 4,00 \text{ m} \\ c &= 10,00 \text{ m} \\ \theta &= 30^\circ \end{aligned}$$



- a. Komponen  $u$  dan  $y$  dari  $\vec{a}$
- b. Komponen  $u$  dan  $y$  dari  $\vec{b}$
- c. Komponen  $u$  dan  $y$  dari  $\vec{c}$
- d. Misalkan  $\vec{c} = p\vec{a} + q\vec{b}$

Tentukan nilai  $p$  &  $q$ !

Jawab:  $\begin{cases} \vec{a} \perp \vec{b}, \theta = 90^\circ \\ \vec{a} = a\hat{u}\hat{i} \\ \vec{b} = b\hat{u}\hat{i} + b\hat{y}\hat{j} \end{cases}$

$$\vec{b} = b\hat{u}\hat{i} + b\sin\theta\hat{j} \Leftrightarrow \vec{b} = b(\cos\theta\hat{i} + \sin\theta\hat{j})$$

$$\begin{aligned} \vec{c} &= c\hat{u}\hat{i} + c\hat{y}\hat{j} \\ \Rightarrow \vec{c} &= c\cos\theta\hat{i} + c\sin\theta\hat{j} \\ &= c\cos(\theta + 90^\circ)\hat{i} + c\sin(\theta + 90^\circ)\hat{j} \end{aligned}$$

a) Komponen  $u$  dari  $\vec{a}$ ?

$$\vec{a} = a\hat{u}\hat{i}$$

$$a = a\cos\theta$$

$$= a \cdot 1 = a \Leftrightarrow 3 \text{ m}$$

$$\begin{aligned} a\hat{i} &= a\sin\theta\hat{o} \\ &= a \cdot 0 = 0 \end{aligned}$$

b) Komponen  $u$  dari  $\vec{b}$ ?

$$\vec{b} = b\hat{u}\hat{i} = b\cos\theta\hat{i}$$

$$\begin{aligned} b\hat{i} &= 4\cos 30^\circ = 4 \cdot \frac{1}{2}\sqrt{3} \\ &= 2\sqrt{3} \text{ m} \end{aligned}$$

$$\rightarrow b\hat{y}\hat{j} = b\sin\theta\hat{j}$$

$$= 4\sin 30^\circ = 4 \cdot \frac{1}{2} = 2 \text{ m}$$

c) Komponen  $u$  dari  $\vec{c}$ ?

$$\vec{c} = c\hat{u}\hat{i} + c\hat{y}\hat{j}$$

$$= c\hat{u}\hat{i} = c\cos(\theta + 90^\circ)\hat{i}$$

$$= 10 \cdot \cos(30 + 90)^\circ$$

$$= 10 \cdot \cos 120^\circ$$

$$= -5 \text{ m}$$

$$= c\hat{y}\hat{j} = c\sin(\theta + 90^\circ)\hat{j}$$

$$= 10 \cdot \sin 120^\circ$$

$$= 8,66 \text{ m}$$

d)  $\vec{c} = p\vec{a} + q\vec{b}$

P & q?

$$\vec{c} = c\cos\theta\hat{i} + c\sin\theta\hat{j}$$

$$= p(a\hat{u}\hat{i}) + q(b\hat{u}\hat{i} + b\hat{y}\hat{j})$$

$$c\cos\theta\hat{i} = p(a\cos\theta\hat{i}) + q(b\cos\theta\hat{i})$$

$$\begin{aligned}\vec{c} &= c \cos \alpha \hat{i} + c \sin \alpha \hat{j} \\ &= p(a \cos \alpha \hat{i}) + q(b \cos \alpha \hat{i} + b \sin \alpha \hat{j}) \\ \vec{c} &= (pa \cos \alpha + qb \cos \alpha) \hat{i} + (qb \sin \alpha) \hat{j}\end{aligned}$$

$$C_x = pa \cos \alpha + qb \cos \alpha;$$

$$C_y = qb \sin \alpha$$

Substitusi:

$$-5M = p(3M) + q(2\sqrt{3}) \hat{i},$$

$$0,66 = 2q$$

$$q = 4,33$$

$$-5M = 3p + 2\sqrt{3}(4,33)$$

$$-3P = 5 + 2\sqrt{3}(4,33)$$

$$P = \frac{5 + 2\sqrt{3}(4,33)}{-3}$$

$$= -6,66 \approx -6,67$$

$$\textcircled{6} \quad \vec{d}_1 = -3\hat{i} + 3\hat{j} + 2\hat{k}$$

$$\vec{d}_2 = -2\hat{i} - 4\hat{j} + 2,0\hat{k}$$

$$\vec{d}_3 = 2\hat{i} + 3\hat{j} + 1\hat{k}$$

Tentukan:

$$\text{a. } \vec{d}_1(\vec{d}_2 + \vec{d}_3)$$

$$\text{b. } \vec{d}_1(\vec{d}_2 \times \vec{d}_3)$$

$$\text{c. } \vec{d}_1 \times (\vec{d}_2 + \vec{d}_3)$$

$$\text{Jawab: a) } \vec{d}_1(\vec{d}_2 + \vec{d}_3)$$

$$= (-3\hat{i} + 3\hat{j} + 2\hat{k})((-2\hat{i} - 4\hat{j} + 2\hat{k}) + (2\hat{i} + 3\hat{j} + 1\hat{k}))$$

$$= \vec{d}_1 \cdot \vec{d}_3$$

$$= (-18 + 3k)(-3\hat{i} + 3\hat{j} + 2\hat{k})$$

$$= -3\hat{i} + 6\hat{k}$$

$$= -3 + 6 = 3$$

$$\begin{aligned}\text{b) } \vec{d}_1(\vec{d}_2 \times \vec{d}_3) &= -3\hat{i} + 3\hat{j} + 2\hat{k} ((-2\hat{i} - 4\hat{j} + 2\hat{k}) \times (2\hat{i} + 3\hat{j} + 1\hat{k})) \\ &= \vec{d}_2 \times \vec{d}_3\end{aligned}$$

$$= (-2\hat{i} - 4\hat{j} + 2\hat{k}) \times (2\hat{i} + 3\hat{j} + 1\hat{k})$$

$$= \begin{vmatrix} 1 & 0 & k \\ -2 & -4 & 2 \\ 2 & 3 & 1 \end{vmatrix}$$

$$= -4\hat{i} - 6\hat{j} // -2\hat{i} - 6\hat{j} // -6 + 8 \\ -10\hat{i} \quad 6\hat{j} \quad 2\hat{k}$$

$$(-10\hat{i} + 6\hat{j} + 2\hat{k})(3\hat{i} + 3\hat{j} + 2\hat{k})$$

$$= (30\hat{i} + 18\hat{j} + 4\hat{k})$$

$$= (30 + 18 + 4) = 52$$

$$\text{c) } \vec{d}_1 \times (\vec{d}_2 + \vec{d}_3)$$

$$= (-3\hat{i} + 3\hat{j} + 2\hat{k}) \times (-1\hat{i} + 3\hat{k})$$

$$= \begin{vmatrix} 1 & 0 & k \\ -3 & 3 & 2 \\ 0 & -1 & 3 \end{vmatrix}$$

$$(1)(-1) // (0)(-1) \\ (1)(-1) // (0)(-1) \\ (1)(-1) // (0)(-1)$$

$$9 + 2 // -9 // 3$$

$$\boxed{11\hat{i} - 9\hat{j} + 3\hat{k}}$$

$\vec{A}$	$\vec{B}$
$1 \cdot 1 = 1$	$1 \cdot 2 = 0$
$A - B = B - A$	

7) Bola mangg ing

$$h_1 = 1,20 \text{ m}$$

$$s_1 = 1,52 \text{ m} \text{ (jatuh)} \text{ (horizontal)}$$

(a) Berapa lama bola berada di lantai?

(b) Berapa kelebatan bola tersebut saat tepat jatuh?

Jawab: (a)  $g \cdot t^2 = h = \frac{1}{2} g t^2$

$$1,20 = \frac{1}{2} \cdot 10 \cdot t^2$$

$$t^2 = \frac{1}{2} \cdot 10^5$$

$$= \frac{1,20}{5}$$

$$t^2 = 0,24 \Leftrightarrow \sqrt{0,24} = 0,498$$

(b)  $v_{b0}/a = \frac{s}{t}$

$$= \frac{1,52}{0,498} = 3,102 \text{ m/s}$$

vec. horizontal

$v_y = g \cdot t$

vec. vertical

$$= 10 \cdot 0,498 = 4,9 \text{ m/s}$$

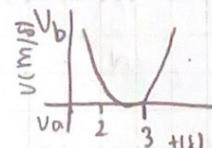
$$v = \sqrt{(3,102)^2 + (4,9)^2} \quad \text{vec. total}$$

$$= 5,198 \text{ m/s}$$

8)  $t=0$

$$v_a = 19 \text{ m/s}$$

$$v_b = 31 \text{ m/s}$$



a) jarak yang ditempuh horizontal sebelum kembali ke permukaan tanah!

b)  $h_{max}$  diatas tanah dicapai

Jawab: jarak horizontal =  $v_{11} \cdot t$

$$31 \text{ m/s} \times 8,8$$

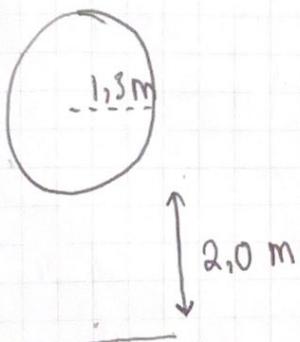
$$155 \text{ m}$$

b)  $h_{max} = v_{11} \cdot t_{max} - \frac{1}{2} g t_{max}^2$

$$= 19 \times 2,5 - \frac{1}{2} \cdot 10 \cdot (2,5)^2$$

$$= 16,25 \text{ m}$$

9)



total = 10 m (horizontal)

Dit: Besar sentripetal batu saat melingkar ?

Jawab: a) waktu yang diperlukan batu untuk jatuh ke tanah

$$h = \frac{1}{2} g t^2$$

$$2,0 = \frac{1}{2} \cdot 10 \cdot t^2$$

$$t^2 = \frac{2,0}{5}$$

$$t = \sqrt{\frac{2,0}{5}} = \frac{\sqrt{10}}{5} = 0,632$$

Kec. horizontal batu?

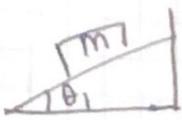
bu  $v_u = \frac{u}{t}$

$$= \frac{10}{0,632} = 15,82 \text{ m/s}$$

$$a_f = \frac{v^2}{r} = \frac{(15,82)^2}{1,5} = 150 \text{ m/s}^2$$

10) Dik:  $m = 0,5 \text{ kg}$

$$\theta = 30^\circ$$



- Dit:
- Besar tegangan tali
  - Gaya normal
  - Alur tali putus, percepatan balon?

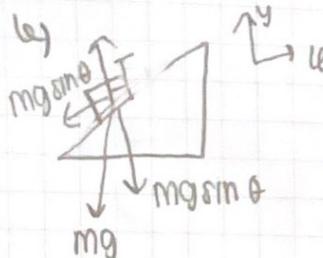
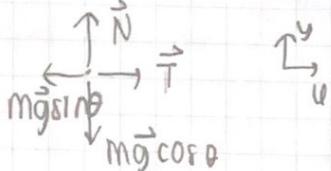


Diagram benda berada :



$$\sum F_x = 0$$

$$\sum F_y = 0$$

$$T - mg \sin \theta = 0 \quad N - mg \cos \theta = 0$$

a) Besar tegangan tali!

$$\sum F_x = 0 \rightarrow T - mg \sin \theta = 0$$

$$T = mg \sin \theta$$

$$= (0,5)(10) \sin 30^\circ$$

$$= 0,5 \cdot 10 \cdot \frac{1}{2}$$

$$= 42,5 \text{ N}$$

b) Besar FN!

$$\sum F_y = 0$$

$$N - mg \cos \theta = 0$$

$$N = mg \cos \theta$$

$$= 0,5 \cdot 10 \cdot \cos 30^\circ$$

$$= 73,6 \text{ N}$$

c) Balon meluncur kebawah, dan Percepatan  $\vec{a}$

$$\boxed{\sum F_x = m \cdot a}$$

$$-mg \sin \theta = m \cdot a$$

$$a = g \sin \theta$$

$$= 10 \sin 30^\circ$$

$$= 10 \cdot \frac{1}{2} = 5 \text{ m/s}^2$$

$\downarrow$   
- arah turun  
kebawah

$$|\vec{a}| = 4,9 \text{ m/s}^2$$

(besar percepatan)

III) Dik:  $m = 2 \text{ kg}$

$$F_1 = 20 \text{ N}$$

$$a = 12 \text{ m/s}^2$$

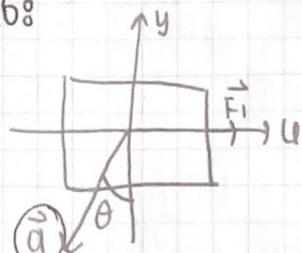
$$\theta = 30^\circ$$

Dit: a) Gaya kedua dalam notasi vektor

b) Gaya kedua

c) Sudut relatif terhadap sumbu u

Jawab:



$$\boxed{\sum F_x = m \cdot a}$$

$$\vec{F}_1 + \vec{F}_2 = m \cdot \vec{a}$$

$$\vec{F}_2 = m \cdot \vec{a} - \vec{F}_1$$

a: kaw 3 then  $F_2$  berada pada kaw 3 (asumsi)

a) Dalam notasi vektor,  $\vec{F}_1 = 20 \text{ N}$   
 $\vec{a} = (-12 \sin 30^\circ \hat{i}) -$   
 $(12 \cos 30^\circ \hat{j})$   
 $\vec{a} = (-6\hat{i} - 10,4\hat{j}) \text{ m/s}^2$

Sehingga  $\vec{F}_2 = m\vec{a} - \vec{F}_1$

$$\begin{aligned}\vec{F}_2 &= (2)(-6\hat{i} - 10,4\hat{j}) - 20\hat{i} \\ \vec{F}_2 &= -32\hat{i} - 20,8\hat{j} \text{ N}\end{aligned}$$

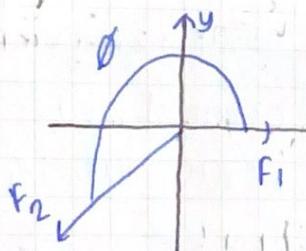
b) besar gaya kedua:

$$\begin{aligned}|\vec{F}_2| &= \sqrt{(-32)^2 + (-20,8)^2} \\ &= 38,2 \text{ N}\end{aligned}$$

c)  $\tan \phi = \frac{\vec{F}_2 y}{\vec{F}_2 x} = \frac{-20,8 \text{ N}}{-32 \text{ N}}$

$$\phi = 33^\circ \text{ atau } 33^\circ + 180^\circ = 213^\circ$$

$$\therefore \phi = 213^\circ$$



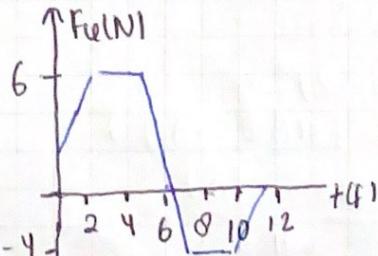
12) Dik:  $m_1 = 3 \text{ kg}$

$$t = 0$$

$$v = 3 \text{ m/s}$$

$$\text{Dit: } v = ? \quad t = 118$$

b) arah gerak balok?



jawab: a)  $I = \Delta p$   
 $= m \Delta v$   
 $L_1 = \frac{1}{2} (6+6) \times 5 = 30 \text{ Ns}$

$$\# t = 5 - 08$$

$$L_2 = \frac{1}{2} (6 + (-4)) \times 3$$

$$= \frac{1}{2} \times 2 \times 3 = 3 \text{ Ns}$$

$$\# t = 88 - 108$$

$$L_3 = \frac{1}{2} (-4) \times 2 = -4 \text{ Ns}$$

$$\# t = 108 - 118$$

$$L_4 = (-4) \times 1 = -4 \text{ Ns}$$

$$\text{Tot: } I = 30 + 3 - 4 - 4 = 25 \text{ Ns}$$

$$I = m \Delta v$$

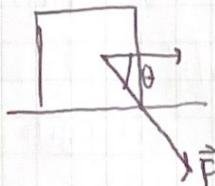
$$25 = 3,0 (v - 3)$$

$$v = 3,0 = \frac{25}{30} \approx 0,83$$

$$v = 0,83 + 3,0 = 11,33 \text{ m/s}$$

b) arahnya ke sb. lq (+)

13)



$$\text{Dik: } m = 3,5 \text{ kg}$$

$$F = 15 \text{ N}$$

$$\theta = 40^\circ$$

$$\mu_{\text{eff}} = 0,25$$

Dit:

a) Besar gaya gesek!

b) porc. balok?

$$F_N = N \mu \times N$$

$$N = mg - F \sin \theta$$

$$N = (3,5 \times 10) - (15 \times \sin 40^\circ)$$

$$= 25,35 \text{ N}$$

$$f_u = \mu u \times N$$

$$= 0,25 \times 25,35 \text{ N}$$

$$= 6,337 \text{ N}$$

b)  $f_u = F \cos \theta$

$$F_u = 15 \times \cos 40^\circ$$

$$= 15 \times 0,766 = 11,49 \text{ N}$$

$$F_{\text{tot}} = F_u - f_u$$

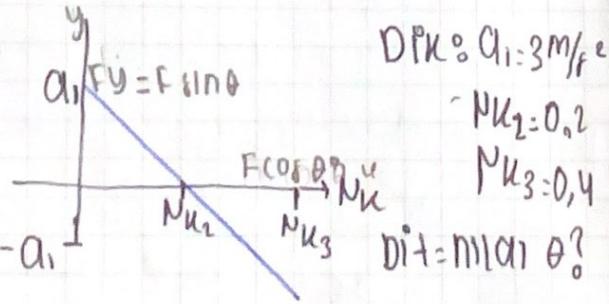
$$= 11,49 - 6,337 = 5,153 \text{ N}$$

$$F = m \cdot a$$

$$a = \frac{F_{\text{tot}}}{m} = \frac{5,153 \text{ N}}{3,5}$$

$$= 1,4712 \text{ m/s}^2$$

14)



$$N = mg - F \sin \theta$$

$$f_u = N u N$$

$$= N u (mg - F \sin \theta)$$

$$F \cos \theta - \mu u (mg - F \sin \theta) = ma$$

$$m|F_a| = m = 1 \text{ kg}$$

$$F \cos \theta - 0,20 (1 \times 10 - F \sin \theta) = 1 \times 3$$

$$F \cos \theta - 0,2 (10 - F \sin \theta) = 3$$

$$F (\cos \theta - 2 + 0,2 F \sin \theta) = 3$$

$$F (0,8 \theta + 0,2) = 5 \text{ N}$$

$$5 (\cos \theta + 0,2) = 5$$

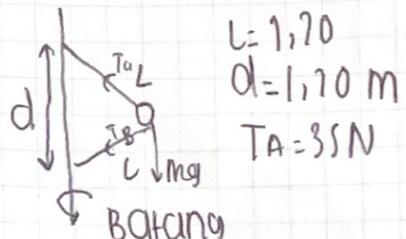
$$\cos \theta + 0,2 = 1$$

$$\cos \theta = 0,8$$

$$\theta = \cos^{-1}(0,8)$$

$$= 36,87^\circ$$

15)



Dit: a) besar  $T_b$  (bawah)?

b) besar  $F_{\text{net}}$ ?

c) besar kec. bola?

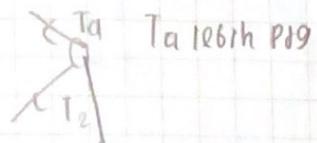
d)  $F_{\text{net}}$ ?

Jawab: a)  $\sum F = 0$

$$T_b \sin \theta - T_b \cos \theta - Mg = 0$$

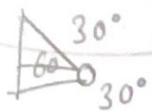
$$\sum F = m \cdot a$$

$$T_b \cos \theta - T_b \sin \theta - Mg = w^2 R$$



$$T_b \sin \theta - T_b \cos \theta - Mg = 0$$

$$T_b = \frac{T_b \sin \theta - Mg}{\sin \theta} = D$$



$$\begin{aligned}T_2 &= T_1 \sin \theta - mg \\&= \frac{\sin \theta}{\sin 30} \\&= \frac{35 \sin 30^\circ - 1,34 \cdot 10}{\sin 30} \\&= \frac{35 \cdot 0,5 - 1,34 \cdot 10}{0,5} \\&= 35 - 13,4 \\&= 21,6 \text{ N}\end{aligned}$$

(b)  $|F_{net}| = |T_2 \cos \theta + T_1 \cos \theta|$

$$\begin{aligned}&= |21,6 \cdot \cos 30 + 35 \cos 30| \\&= |21,6 \cdot \frac{1}{2}\sqrt{3} + 35 \cdot \frac{1}{2}\sqrt{3}| \\&= 87,30\end{aligned}$$

(c) arah bola?

$$\begin{aligned}\frac{d}{2R} &= \frac{d}{2 + \tan 30} \\&= \frac{10^5}{2\sqrt{3}} = 2,886 \text{ M}\end{aligned}$$

(d) arah?

Wktu sumbu u negatif