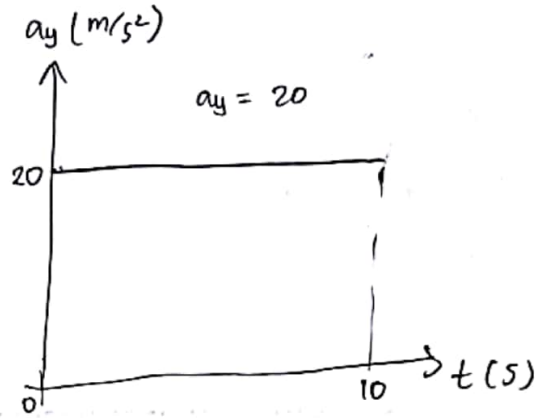
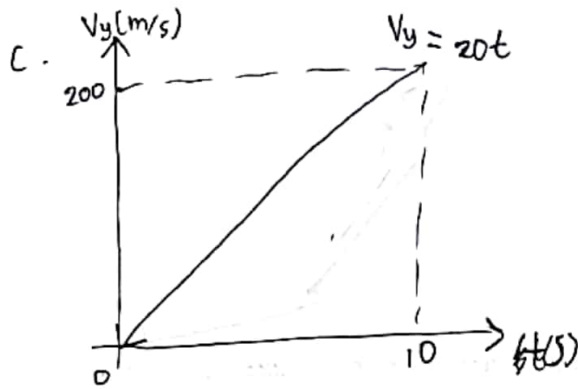


1) a. $\Delta \vec{r}(10) = 80\hat{i} + 1000\hat{j} \text{ m}$

b. $\Delta \vec{r} = \vec{r} - \vec{r}_0$

$80\hat{i} + 1000\hat{j} = \vec{r} - (2\hat{i} + 3\hat{j})$

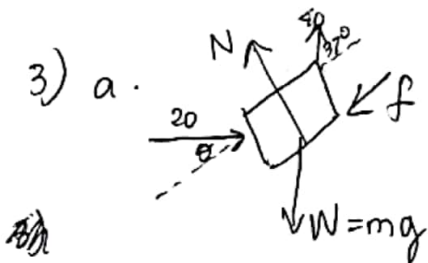
$\vec{r} = 82\hat{i} + 1003\hat{j} \text{ m}$



2) a. $x(2) = 8 \text{ m}$, $x(4) = \frac{8}{7} \text{ m}$, $x(8) = 11 \text{ m}$, $x(10) = 12 \text{ m}$, $x(12) = 4 \text{ m}$

b. $t = 2, 7, 8, 11$ (saat $x' = 0$)

c. $v_{\text{avg}} = \frac{x(12) - x(0)}{12 - 0} = \frac{4 - 0}{12} = \frac{1}{3} \text{ m/s}$



c. Asumsi d meter,

$v_t^2 = v_0^2 + 2ad$

$v_t^2 = 2ad = 2,82 d$

$v_t = \sqrt{2,82 d} \text{ m/s}$

b. $\cancel{f_{s, \text{max}}} * f_{s, \text{max}} = \mu_s \cdot N$

$= 0,3 \cdot (mg \cos 30^\circ + 20 \sin 30^\circ - 40 \sin 37^\circ)$

$= 0,3 (125\sqrt{3} + 10 - 24)$

$= 0,3 (125\sqrt{3} - 14)$

$\approx 60,75 \text{ N}$

* total gaya arah -x $= |20 \cos 30^\circ + 40 \cos 37^\circ - mg \sin 30^\circ|$

$= |10\sqrt{3} + 32 - 125|$

$= |10\sqrt{3} - 93|$

$\approx 75,68 \text{ N}$

benda bergerak

$\Sigma F = ma$

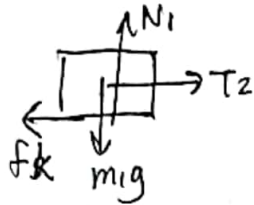
$75,68 - 0,2(125\sqrt{3} - 14) = 25a$

$25a = 35,18$

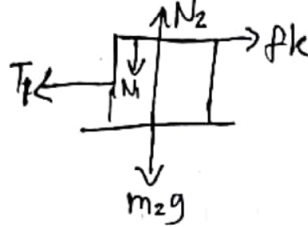
$a = 1,41 \text{ m/s}^2$

ke atas

4) a. Benda 1



Benda 2



Benda 3



b. $T_2 - f_k = m_1 a$

$$m_3 g - T_2 = m_3 a$$

$$m_3 g - f_k = (m_1 + m_3) a$$

$$m_1 (10) - \mu_k m_1 g = (1 + 2) a$$

$$10 - 0,2 \cdot 2 \cdot 10 = 3a$$

$$10 - 4 = 3a$$

$$6 = 3a$$

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

c. $T_1 = f_k = \mu_k \cdot m_1 g$

$$T_1 = 0,2 \cdot 2 \cdot 10 = 4 \text{ N}$$

$T_2 - f_k = m_1 a$

$$T_2 - 4 = 2 \cdot 2$$

$$T_2 - 4 = 4$$

$$T_2 = 8 \text{ N}$$

5) a. $E_p = \frac{1}{2} k x^2 = \frac{1}{2} m v_A^2$

$$v_A^2 = \frac{k}{m} x^2$$

$$v_A = x \sqrt{\frac{k}{m}} = x \sqrt{\frac{1200}{0,2}} = 20\sqrt{15} x \text{ m/s}$$

$$v_B^2 = v_A^2 - 2a \cdot s$$

$$v_B^2 = 6000 x^2 - 2 \cdot 2 \cdot 2,5$$

$$v_B^2 = 6000 x^2 - 10$$

$f = m \cdot a$

$$\mu mg = m \cdot a$$

$$a = \mu \cdot g = 0,2 \cdot 10 = 2 \text{ m/s}^2$$

~~$$\frac{1}{2} m v_B^2 = \frac{1}{2} m v_D^2 + mg(2R)$$~~

$$\sum F = m \cdot a_{sp} = m \cdot \frac{v^2}{R}$$

$$N + mg = m \cdot v_D^2$$

$$0 + mg = m \cdot v_D^2$$

$$v_D^2 = g = 10$$

$$\frac{1}{2} m v_B^2 = \frac{1}{2} m v_D^2 + mg(2R)$$

$$\frac{1}{2} v_B^2 = \frac{1}{2} v_D^2 + 2gR$$

$$v_B^2 = v_D^2 + 4gR$$

$$6000 x^2 - 10 = 10 + 40$$

$$6000 x^2 = 50$$

$$x^2 = \frac{1}{120}$$

$$x = 0,0913 \text{ m} = 9,13 \text{ cm}$$

b. ~~$\Sigma F = m \cdot a_{sp}$~~ * $\frac{1}{2} m v_B^2 = \frac{1}{2} m v_C^2 + mgR$

~~a_{sp}~~

$$v_B^2 = v_C^2 + 2g$$

$$v_C^2 = v_B^2 - 2g = 6000 \times^2 - 10 - 20 = 6000 \times^2 - 30$$

~~$\Sigma F = m \cdot a_{sp}$~~ * $a_{sp} = \frac{v_C^2}{R} = \frac{6000 \times^2 - 30}{120} - 30 = 20 \text{ m/s}^2$
(ke pusat)

c. ~~$y = v_0 t + \frac{1}{2} g t^2$~~ * $y = v_{0y} t + \frac{1}{2} g t^2$

~~$y = v_0 t + \frac{1}{2} g t^2$~~

$$2 = 0 \cdot t + 5 t^2$$

$$t^2 = 0,4$$

$$t = \sqrt{0,4} = 0,63 \text{ sekon}$$

* Jarak dari B = $v_D \cdot t = \sqrt{10} \cdot \sqrt{0,4} = \sqrt{4} = 2 \text{ m}$