UTS FISIKA 1A 2004

Reynald Saputra

1) a. i) kecepatan 0, percepatan = percepatan gravitasi

ii) kecepatan v_0, percepatan = percepatan gravitasi

b. Gerak melingkar beraturan, ~~kecepatan~~ laju tetap tetapi percepatan tidak nol (ada perubahan vektor kecepatan)

2) a.i. Gerak lurus berubah beraturan dipercepat

ii. Diam

iii. Diam

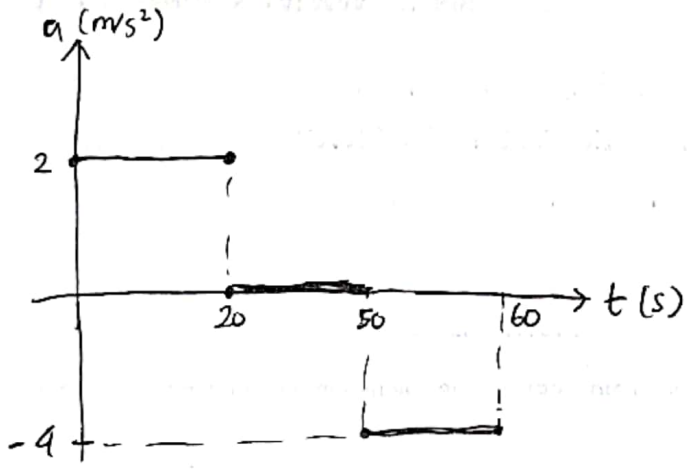
iv. Bila lantai kasar, Gerak lurus berubah beraturan diperlambat. Bila lantai licin, gerak lurus beraturan

b. Ketika benda memiliki ketinggian. Contoh: saat jatuh bebas

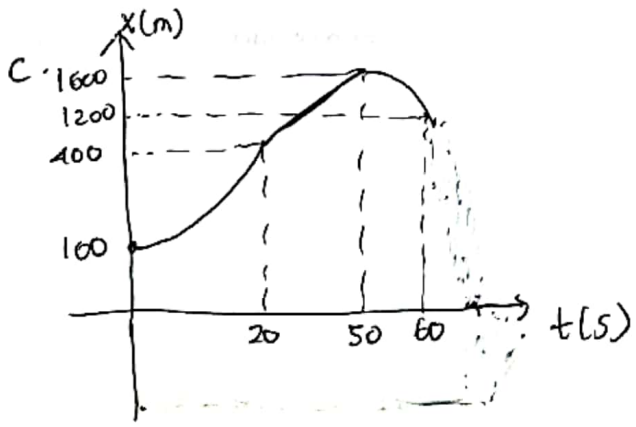
c. Iya, karena merupakan gerak bolak-balik dalam periode waktu yang sama

3) a. $v_{rata\text{-}rata} = \frac{x(60) - x(0)}{60 - 0} = \frac{\text{Luas}}{60} = \frac{(30+60)}{2} \times 40 \times \frac{1}{60} = 45 \cdot \frac{2}{3} = 30\ m/s$

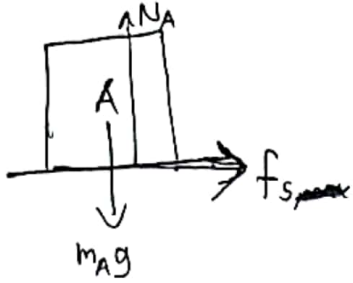
b.

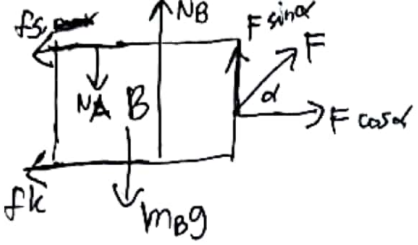


c.



4) a.





b. * ~~$f_s = m_A a$~~

~~$\mu_s \cdot m_A \cdot g = m_A \cdot a$~~

$F\cos\alpha - f_k = (m_A + m_B)\, a$

$F\cos\alpha - \mu_k \cdot (m_A + m_B)\, g = (m_A + m_B)\, a$

$a = \dfrac{F\cos\alpha}{m_A + m_B} - \mu_k \cdot g$

5) b. $\Sigma F = m \cdot a_{sp}$

$mg = m \cdot \dfrac{V^2}{R}$

$V^2 = gR = 10 \times 10^6 \times 6{,}37 = 6{,}37 \times 10^7$

$V = 7918{,}33 \ m/s$

a. $\omega = \dfrac{V}{R} = 0{,}0012 \ rad/s$

c. Percepatan sentripetal, besarnya : $a_{sp} = \dfrac{V^2}{R} = g = 10 \ m/s^2$

6) a. $EK_1 + EP_1 = EK_2 + EP_2$

$0 + mgh = \overset{0}{\cancel{\tfrac{1}{2}mv^2}} + mgR$

$h = R$

b. * $EK_1 + EP_1 = EK_2 + EP_2$

$0 + mgR = \frac{1}{2}mV_B^2 + 0$

$V_B = \sqrt{2gR}$

* $f = ma$

$\mu mg = ma$

$a = \mu g$

* $V_D^2 = V_B^2 - 2ad$

$V_D^2 = 2gR - 2\mu g d$

* $EK = E_p$

$\frac{1}{2}mV_D^2 = E_p$

$E_p = \frac{1}{2}m\,(2gR - 2\mu g d)$

$= mgR - \mu mgd$

$= mg\,(R - \mu d)$