

MOHD REZA FADHLAN B. DAUD
SX 060677MMJ04

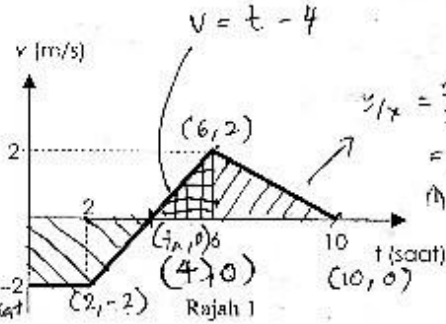
~~$a = v/t$~~
 ~~$a = (2/6)$~~
 ~~$a = 0.33 \text{ m/s}^2$~~

8
7
6 1/2

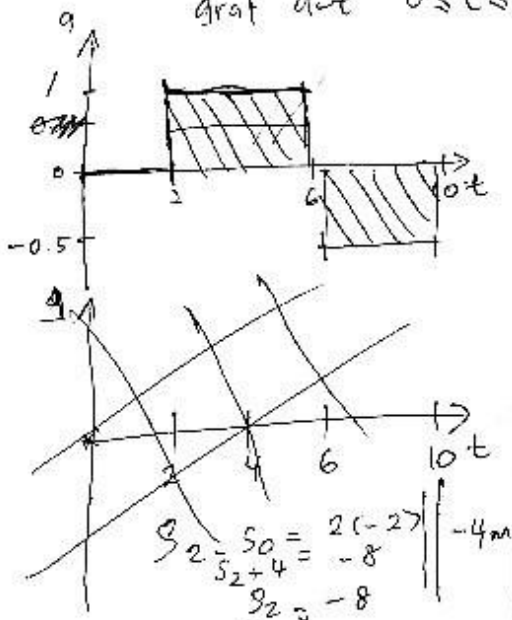
SOALAN 1

$S_1 - S_0 = Vt + \frac{1}{2} a t^2$

Pergerakan satu zarah melalui garish lurus menepati hubungan halaju dengan masa seperti dalam Rajah 1. Diketahui, pada $t = 0$ saat, $s = -4$ m. Plot graf $(a-t)$ dan $(s-t)$ bagi pergerakan $0 \leq t \leq 10$ saat.



graf $a-t$ $0 \leq t \leq 10$ saat



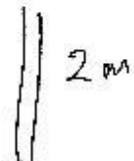
$y = mx + c$
 $m = y/x$
 $= \frac{2+2}{6-2}$
 $m = 1$
 $y - 2 = x - 6$
 $2 = x + c$
 $c = -4$
 $v = t - 4$

$a = \frac{d^2s}{dt^2}$
 $a = t - 4$

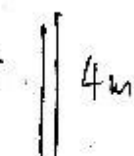
Find t_A
 $m = y/x$
 $1 = \frac{0+2}{t_A-2}$
 $t_A - 2 = \frac{2}{1}$
 $t_A = 2 + 2$
 $t_A = 4 \text{ saat}$

$S_4 - S_0 = \dots$
 $S_4 - S_0 = \text{Luas Area}$
 $S_4 - (-4) = \frac{1}{2} (4+2)(-2)$
 $S_4 = -2$
 $S_4 = -6 + 4 = -2$
 $S_4 = 10 - 2 = 8$
 $S_4 - S_2 = \frac{1}{2} (2)(-2)$
 $S_4 + 8 = -2$
 $S_4 = -10$

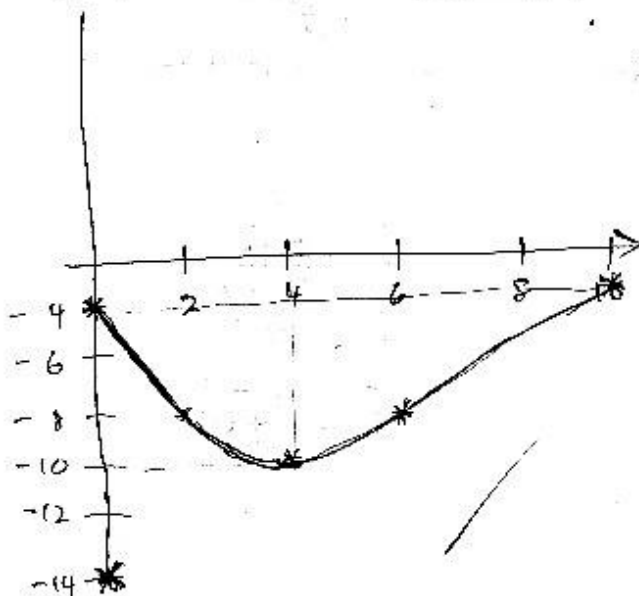
$$s_8 - s_4 = \text{Luas } \triangle \\ = \frac{1}{2}(2)(2)$$

$$s_6 - (-10) = 2 \\ s_6 = 2 - 10 \\ s_6 = -8$$


$$s_{10} - s_6 = \text{Luas } \triangle \\ = \frac{1}{2}(4)(2)$$

$$s_{10} - (-8) = 4 \text{ m} \\ s_{10} = 4 - 8 \\ s_{10} = -4$$


graf $s-t$ $0 \leq t \leq 10$ saat



$$\dot{r} = V_r$$

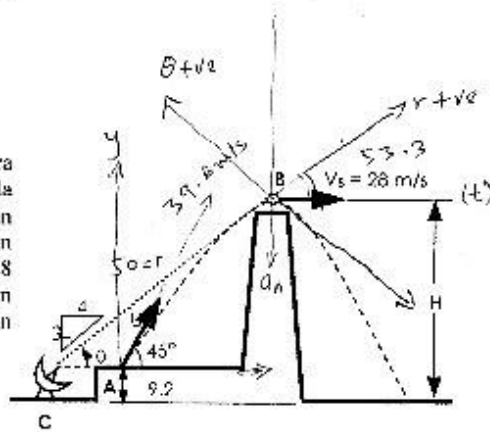
$$r\ddot{\theta} = V_\theta$$

$$V_2^2 = V_1^2 + 2ay(S_2 - S_1)$$

SOALAN 2

Satu zarah dilepaskan ke udara dengan halaju $U = 39.6 \text{ m/s}$ pada sudut 45° . Pergerakan zarah dikesan oleh satu radar di C. Pada kedudukan tertinggi B, halaju zarah adalah 28 m/s dan jarak antara zarah dengan radar adalah $r = 50 \text{ m}$. Dengan mengambil $g = 10 \text{ m/s}^2$, tentukan:

- ketinggian H
- a_n , a_t dan ρ di B
- \dot{r} dan $\ddot{\theta}$ ketika zarah berada di B.



$$\dot{r} = \dot{\theta}$$

analisa arah-x

$$V_{sx} = V \cos \theta$$

$$= 28 \text{ m/s}$$

analisa arah-y

$$V_{sy} = V \sin \theta$$

$$= 28 \text{ m/s}$$

$$(V_{By})^2 = (V_{Ay})^2 + 2(-10)(H - 9.2) - 0$$

$$0 = (28)^2 + (-20)(H - 9.2)$$

$$= 784 - 20H + 184$$

$$20H = 968$$

$$H = 48.4 \text{ m}$$

$$a_n = \frac{v^2}{\rho}$$

$$a_n = -10 \cos \theta$$

$$= -10 \text{ m/s}^2$$

$$a_t = -10 \sin \theta$$

$$= 0 \text{ m/s}^2$$

$$\theta = \tan^{-1} \frac{4}{3} \text{ Rajah 2}$$

$$\theta = 53.13^\circ$$

$$\rho = \frac{v^2}{a_n}$$

$$= \frac{(28)^2}{10}$$

$$= 78.4 \text{ m}$$

$$\dot{r} = V_r = -V \cos \theta$$

$$= -V \cos 53.1$$

$$= -28 \cos 53.1$$

$$= -16.81 \text{ m/s}$$

$$r\ddot{\theta} = V_\theta = -28 \sin 53.1$$

$$= -16.81 \text{ m/s}$$

$$\ddot{\theta} = \frac{-16.81 \text{ m/s}}{50}$$

$$= -0.3362 \text{ rad/s}$$

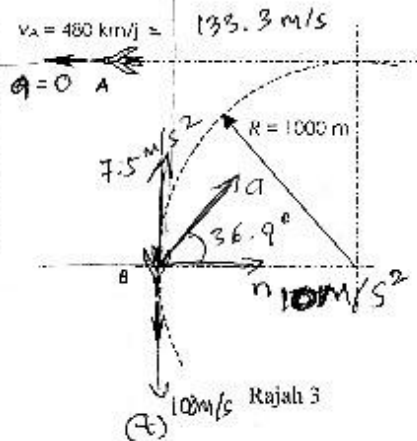
$$V_{B/A} = V_B - V_A$$

$$V_B = V_{B/A} + V_A$$

SOALAN 3

Rajah menunjukkan pandangan plan kapal terbang A dan B yang sedang bergerak pada aras yang sama. Kapal terbang A bergerak lurus dengan kelajuan malar 480 km/j sementara kapal terbang B membuat penerbangan membulat dengan kelajuan 360 km/j dan melambat dengan kadar 7.5 m/s^2 . Tentukan pada ketika yang ditunjukkan:

- hataju kapal terbang B dilihat oleh juruterbang A ($v_{B/A}$).
- pecutan kapal terbang B dilihat oleh juruterbang A ($a_{B/A}$).



$$V_B = V_{B/A} + V_A$$

analisa paksi - x dan y

magnitud vektor	magnitud	arah
V_A	133.3	←
$V_{B/A}$?	↙
V_B	100 m/s	← ↓ 90°

$$(V_B)_x = (V_{B/A})_x + (V_A)_x$$

$$0 = (V_{B/A})_x + 133.3 \text{ m/s}$$

$$(V_{B/A})_x = -133.3 \text{ m/s}$$

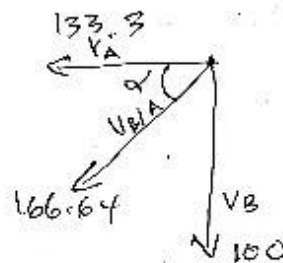
$$(V_B)_y = (V_{B/A})_y + (V_A)_y$$

$$-100 = (V_{B/A})_y + 0$$

$$V_{B/A} = -100 \text{ m/s}$$

$$V_{B/A} = \sqrt{133.3^2 + 100^2}$$

$$V_{B/A} = 166.64 \text{ m/s}$$

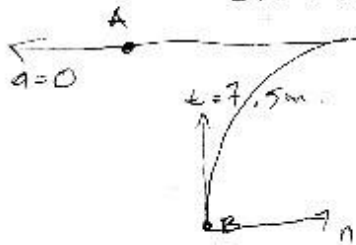


$$\alpha = \tan^{-1} 100/133.3$$

$$\alpha = 36.88^\circ$$

$$a_{B/A} = a_B - a_A$$

$$a_B = a_{B/A} + a_A$$



$$a = at$$

$$a_n = 0 = a \cos 90 = 0$$

$$a = 7.5 = at$$

Vektor	Magnitude	Arah
a_n	10	\rightarrow
a_t	7.5	\uparrow
a_A	0	\leftarrow
$a_{B/A}$?	\leftarrow

arah -x

$$(a_B)_x = (a_{B/A})_x + (a_A)_x$$

$$(12.5 + 7.5)_x = (a_{B/A})_x + (0)$$

$$12.5 + 7.5 = (a_{B/A})_x +$$

$$(a_B)_x = (a_{B/A})_x + 0$$

$$12.5 \cos 36.9 =$$

$$12.5 \cos 36.9 = (a_{B/A})_x + 0$$

$$10 = (a_{B/A})_x$$

$$(a_{B/A})_x = 10 \text{ m/s}^2$$

arah = y

$$(a_B)_y = (a_{B/A})_y + (a_A)_y$$

$$12.5 \sin 36.9 = (a_{B/A})_y + 0$$

$$7.5 = (a_{B/A})_y$$

$$a_{B/A} = \sqrt{(a_{B/A})_x^2 + (a_{B/A})_y^2}$$

$$a_{B/A} = 12.5 \text{ m/s}^2$$

$$a = \sqrt{a_n^2 + a_t^2}$$

$$a = 7.5 \text{ m/s}^2$$

$$a_n = \frac{v^2}{r}$$

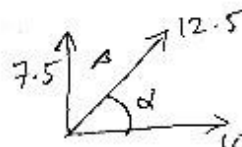
$$= \frac{(100)^2}{1000}$$

$$a_n = 10 \text{ m/s}^2$$

$$a = \sqrt{10^2 + 7.5^2}$$

$$a_B = 12.5 \text{ m/s}^2$$

$$a_B = 12.5 \text{ m/s}^2$$



$$\alpha = \tan^{-1} \frac{7.5}{10}$$

$$\alpha = 36.9^\circ$$

$$\beta = 53.1^\circ$$

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SY060677MMJ04
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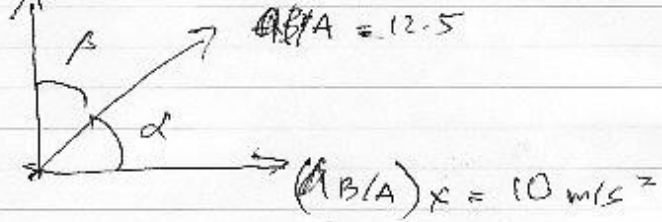


No. Kad Pengenalan
No. Soslan

Muka surat
Jangan tulis apa-apa di kedua-dua belah garisan

$$a_{B/A} = 12.5 \text{ m/s}^2$$

$$(a_{B/A})_y = 7.5 \text{ m/s}^2$$



$$\alpha = \tan^{-1} 7.5/10$$

$$\alpha = 36.9^\circ$$

$$\therefore a_{B/A} = 12.5 \text{ m/s}^2 \text{ } \alpha \text{ } 36.9^\circ$$