

"Tugas mekanika"

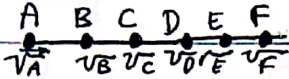
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NPM: 2013022048.

KELAS: B.

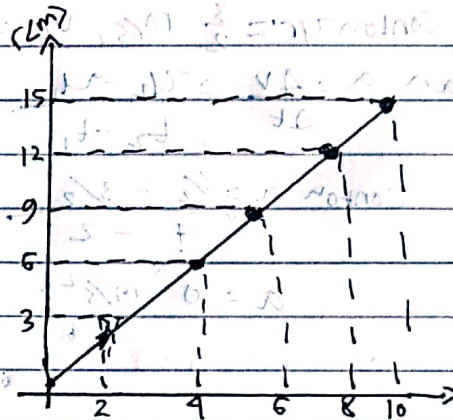
Uji Pemahaman konsep I

A) Gerak lurus Beraturan.



Vektor Posisi	Waktu tempuh
$\vec{v}_A$	0
$\vec{v}_B$	2
$\vec{v}_C$	4
$\vec{v}_D$	6
$\vec{v}_E$	8
$\vec{v}_F$	10

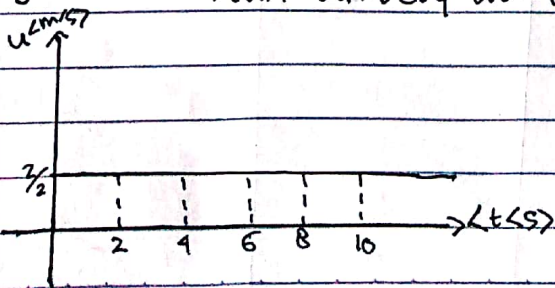
Grafik Posisi terhadap waktu.



Persamaan Posisi $r = v_0 + u \cdot t \Rightarrow v_B = v + u \cdot t$
 $x_t = v_{0x} \cdot t$ $3 = 0 + u \cdot 2$
 $u = 3/2$

Waktu tempuh	Vektor Posisi	Kecepatan
0	$\vec{v}_A = 0$	0
2	$\vec{v}_B = 3i$	$3/2$
4	$\vec{v}_C = 6i$	$3/2$
6	$\vec{v}_D = 9i$	$3/2$
8	$\vec{v}_E = 12i$	$3/2$
10	$\vec{v}_F = 15i$	$3/2$

Grafik Kecepatan terhadap waktu.



→ Persamaan kecepatan $v_t = \frac{dx}{dt} = \text{konstan}$

Contoh $v_B = \frac{3}{2} \text{ m/s}$, $v_C = \frac{6}{4} = \frac{3}{2} \text{ m/s}$

⇒ Persamaan percepatan $a = \frac{\Delta v}{\Delta t} = \frac{v_2 - v_1}{t_2 - t_1} = 0$

Contoh $a = \frac{\frac{3}{2} - \frac{3}{2}}{4 - 2}$

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

⇒ Percepatan $v_t = \frac{dx}{dt} = \text{konstan}$

Contoh $v_r = \frac{3}{2} \text{ m/s}$, $v_c = \frac{6}{4} = \frac{3}{2} \text{ m/s}$

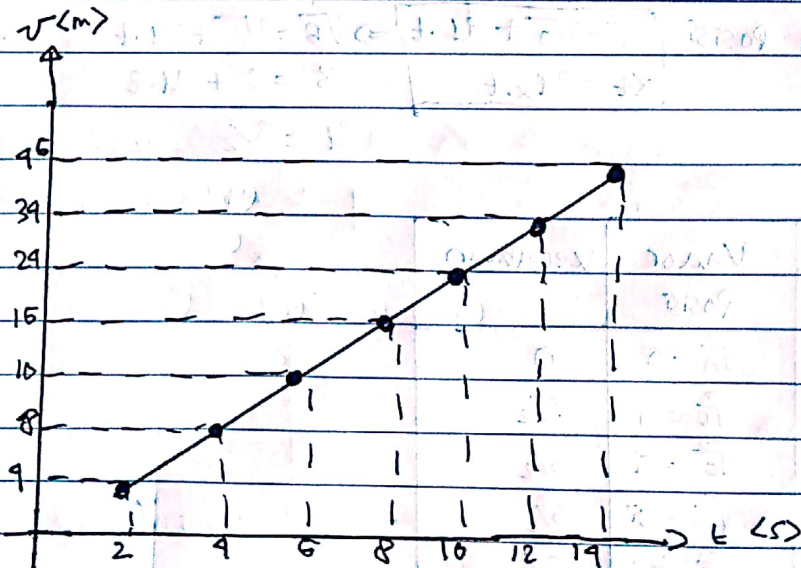
⇒ Percepatan $a = \frac{\Delta v}{\Delta t} = \frac{v_2 - v_1}{t_2 - t_1} = 0$

Contoh $a = \frac{\frac{3}{2} - \frac{3}{2}}{4 - 2}$

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

B) GLBB.

Vektor Posisi	Waktu Tempuh
$\vec{r}_A = 0$	0
$\vec{r}_B = 9i$	2
$\vec{r}_C = 5i$	4
$\vec{r}_D = 10i$	6
$\vec{r}_E = 15i$	8
$\vec{r}_F = 24i$	10
$\vec{r}_G = 39i$	12
$\vec{r}_H = 46i$	14



⇒ Persamaan Posisi

$x_t = x_0 + ct^2$

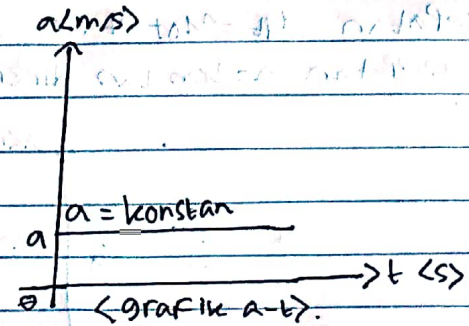
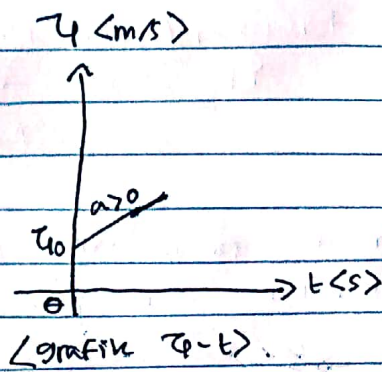
c , konstanta tergantung pada benda dan waktu

⇒ Persamaan kecepatan benda.

$v_t = v_0 + at$

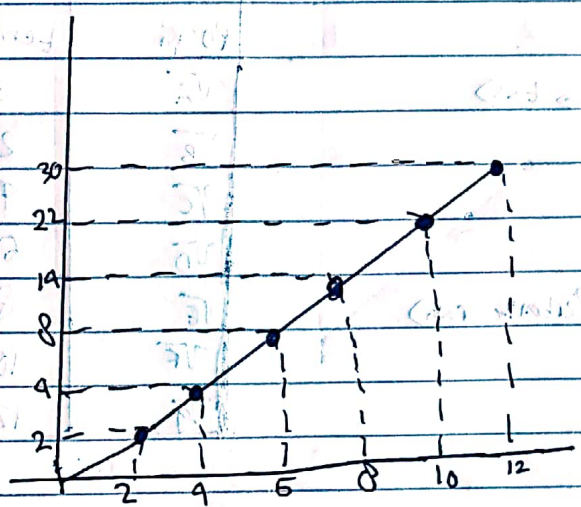
⇒ Persamaan percepatan benda.

$a = \text{konstan}$



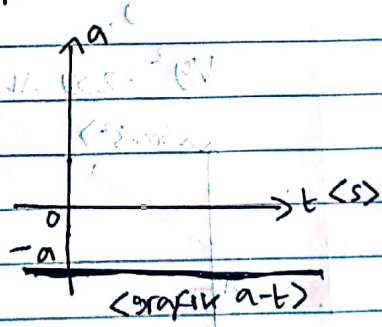
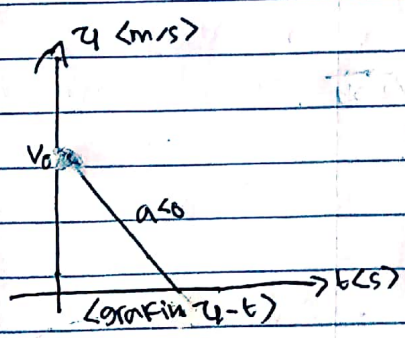
C.) Gerak Vertikal ke atas.

Vektor Posisi	Waktu tempuh
$\vec{v}_A = 0i$	0
$\vec{v}_B = 2i$	2
$\vec{v}_C = 4i$	4
$\vec{v}_D = 6i$	6
$\vec{v}_E = 8i$	8
$\vec{v}_F = 12i$	10
$\vec{v}_G = 30i$	12



Persamaan Kecepatan $v_t = v_0 - at$.

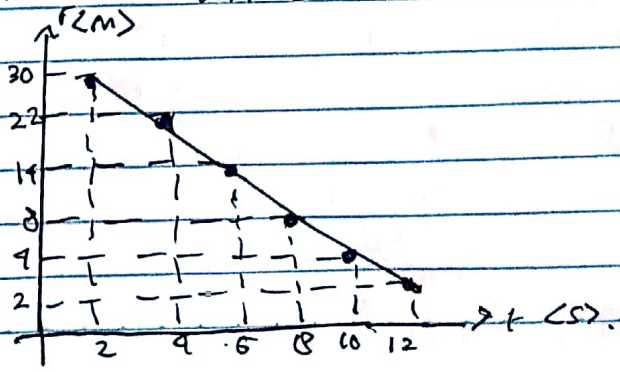
=> Persamaan Percepatan berada $g = \text{konstan}$ diperlambat.



D.) gerak Vertikal ke Bawah

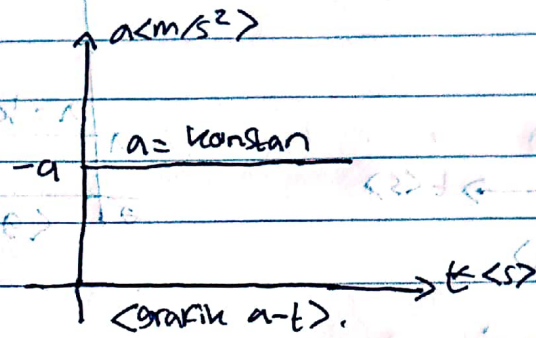
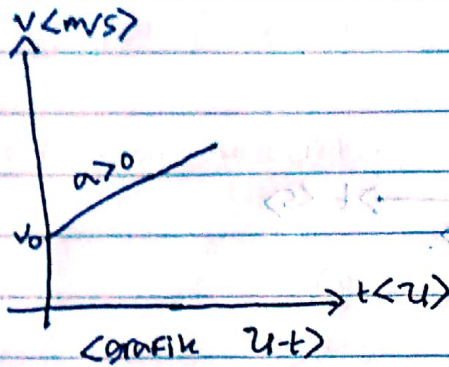
Vektor Posisi	Waktu tempuh
$\vec{v}_A = 30i$	0
$\vec{v}_B = 22i$	2
$\vec{v}_C = 14i$	4
$\vec{v}_D = 6i$	6
$\vec{v}_E = 4i$	8
$\vec{v}_F = 2i$	10
$\vec{v}_G = 0i$	12

grafik Posisi terhadap waktu

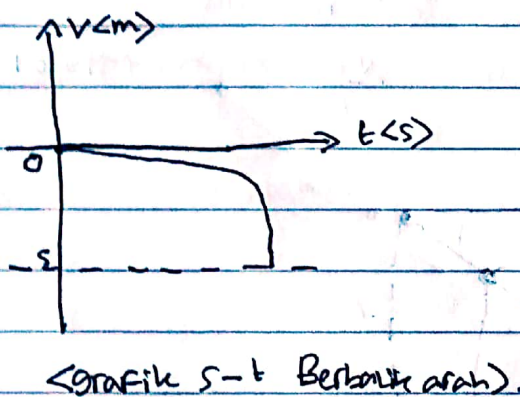


Persamaan kecepatan $v_t = v_0 + at$

$\Rightarrow$ Persamaan kecepatan $a = \text{konstan}$ dipercepat.



e) Gerak jatuh bebas.



Waktu	Posisi	Waktu	Posisi
0	v_A	0	v_A
2	v_B	2	v_B
4	v_C	4	v_C
6	v_D	6	v_D
8	v_E	8	v_E
10	v_F	10	v_F
12	v_G	12	v_G

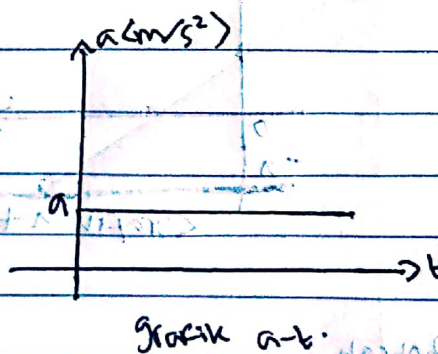
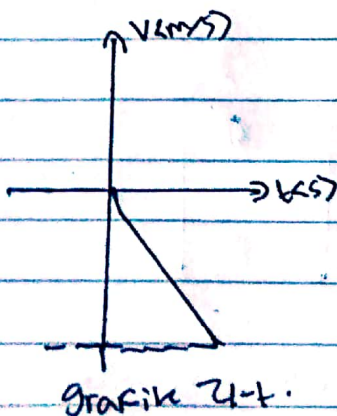
$\Rightarrow$ Persamaan Posisi

$$\rightarrow y = y_0 + ct^2$$

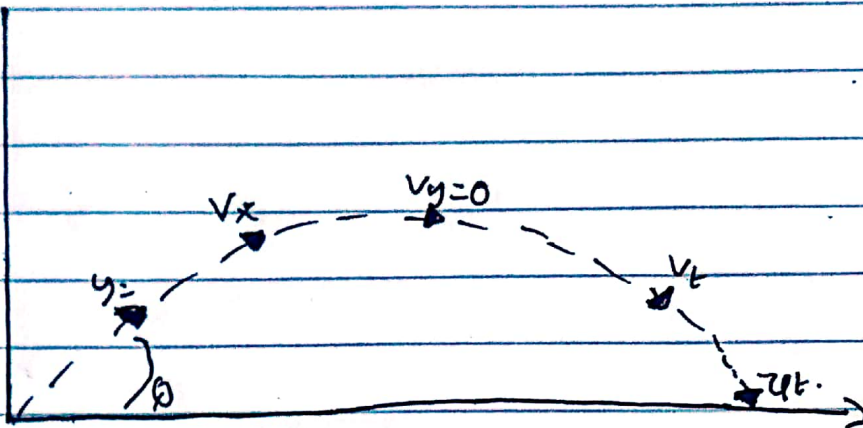
$\rightarrow$ Persamaan Kecepatan benda.

$$v_y = \frac{dy}{dt} = 2ct$$

$$v_y^2 = 2gy \text{ atau } v_y = \sqrt{2gy}$$



F). Gerak Parabola.



$V = \sqrt{v_x^2 + v_y^2}$	kecepatan $\langle v_x, v_y \rangle$	
	Sumbu x	Sumbu y.
Kondisi awal	$v_0 \cos \theta$	$v_0 \sin \theta$
Suatu t Sekon.	$v \cos \theta$	$v \sin \theta$

	kedudukan $\langle x, y \rangle$		waktu yg diperlukan.
	Sb x	Sb y	
Kedudukan awal	0	0	0
Suatu t Sekon	$x = v_0 \cos \theta \cdot t$	$y = v_0 \sin \theta \cdot t - \frac{1}{2} a t^2$	t.
Pada titik tertinggi	$x = \frac{v_0^2 \sin 2\theta}{2g}$	$y_{\max} = \frac{v_0^2 \sin^2 \theta}{2g}$	$F = \frac{v_0 \sin \theta}{g}$
Pada titik terjauh	$x_{\max} = \frac{v_0^2 \sin 2\theta}{g}$	0	$t = \frac{2 v_0 \sin \theta}{g}$