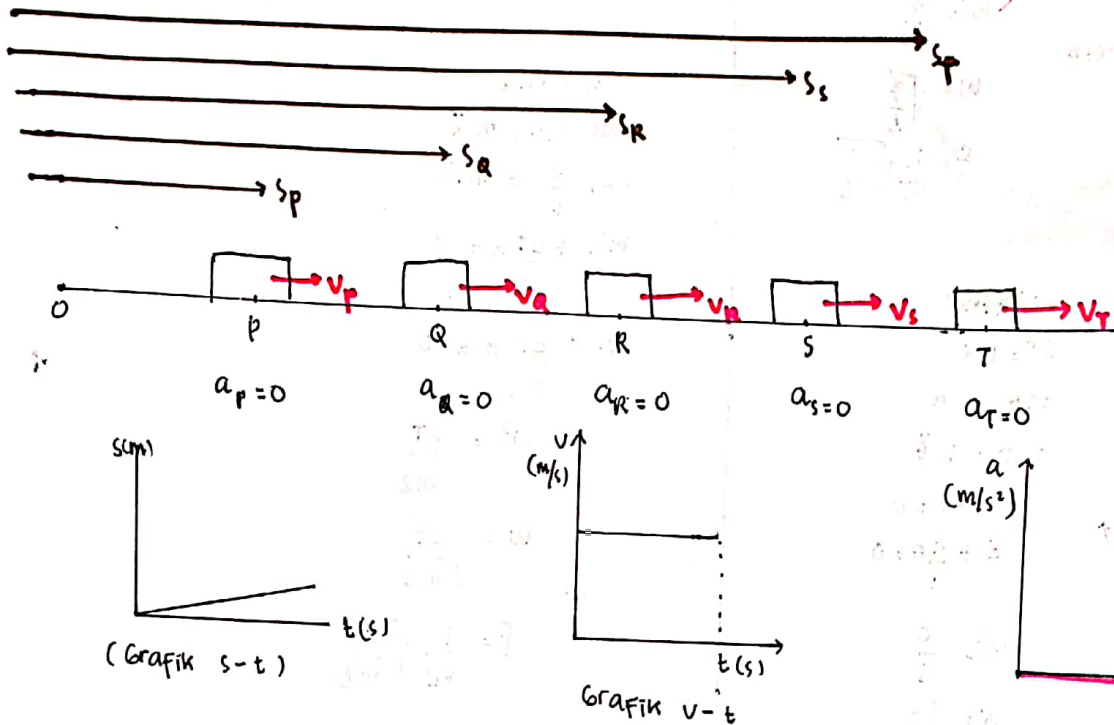


Uji Pemahaman Konsep I

GLB



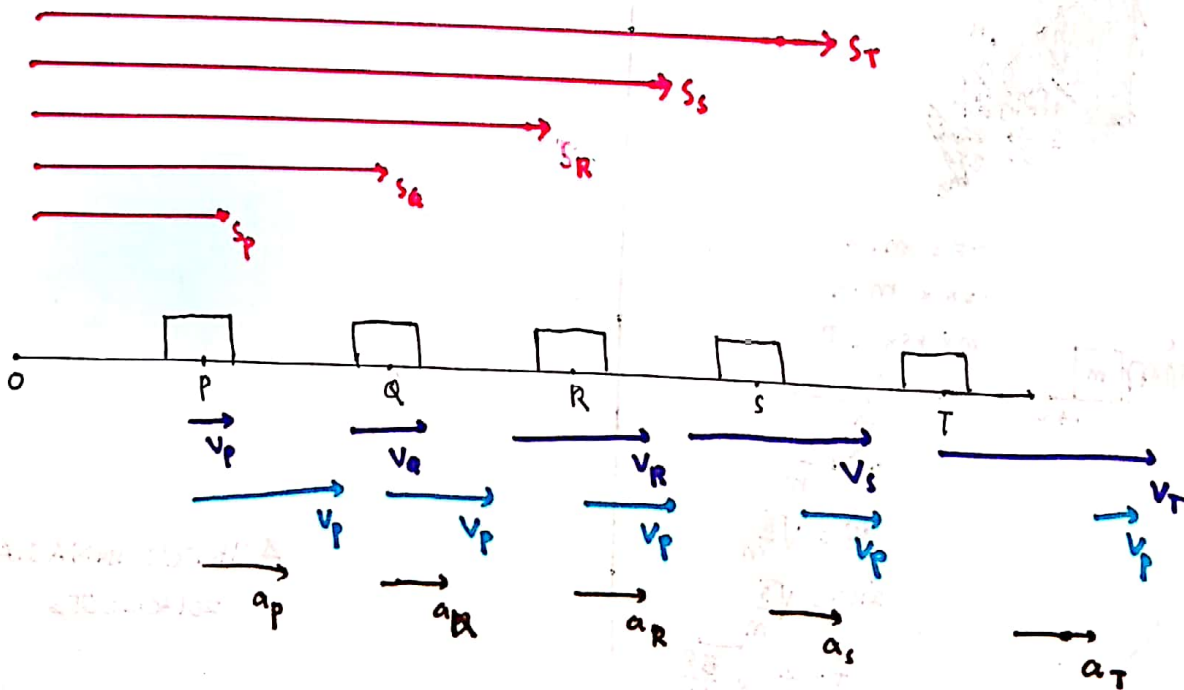
Persamaan

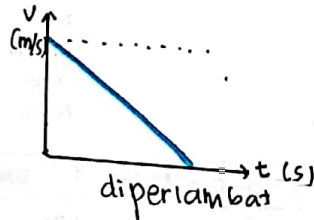
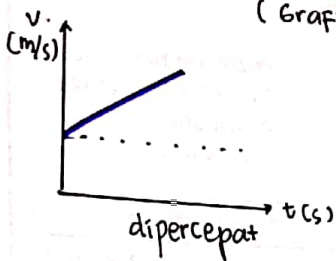
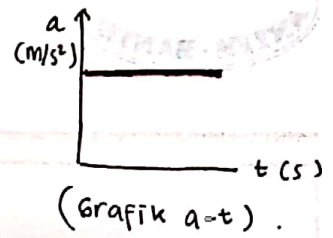
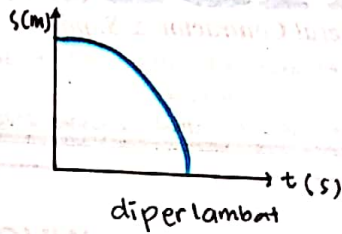
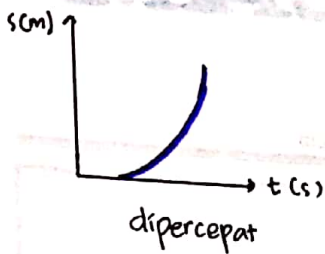
$$s = v \cdot t \quad \cdot v_t = \frac{dx_t}{dt}$$

$$v = \frac{s}{t} \quad \cdot a_t = \frac{dv_t}{dt}$$

$$a = 0 \quad \cdot x_t = v \cdot t$$

GLBB





(Grafik $s-t$)

(Grafik $v-t$)

Persamaan

- $v_t = v_0 \pm at$
- $+$ = dipercepat
- $-$ = diperlambat

$$v_t = \frac{dx}{dt}$$

$$a_t = \frac{dv_x}{dt}$$

Persamaan gerak vertikal keatas

GLBB	$v_t = v_0 + at$	$s = v_0 \cdot t + \frac{1}{2}at^2$	$v_t^2 = v_0^2 + 2as$
GVA	$v_t = v_0 - gt$	$h = v_0 \cdot t - \frac{1}{2}gt^2$	$v_t^2 = v_0^2 - 2gh$

- tinggi maksimum

$$v_t^2 = v_0^2 - 2gh$$

$$0 = v_0 - gt$$

$$\therefore h_{\max} = \frac{v_0^2}{2g}$$

- waktu

$$v_t = v_0 - gt$$

$$0 = v_0 - g \cdot t_{\max}$$

$$t_{\max} = \frac{v_0}{g} \equiv t_1$$

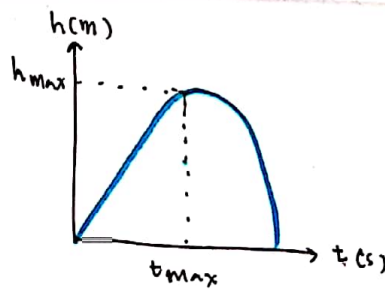
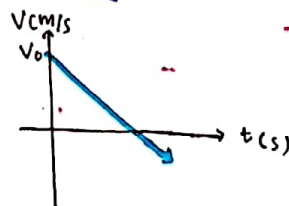
karena waktu naik = turun

Maka:

$$\text{lamanya benda di udara} = 2t_{\max}$$

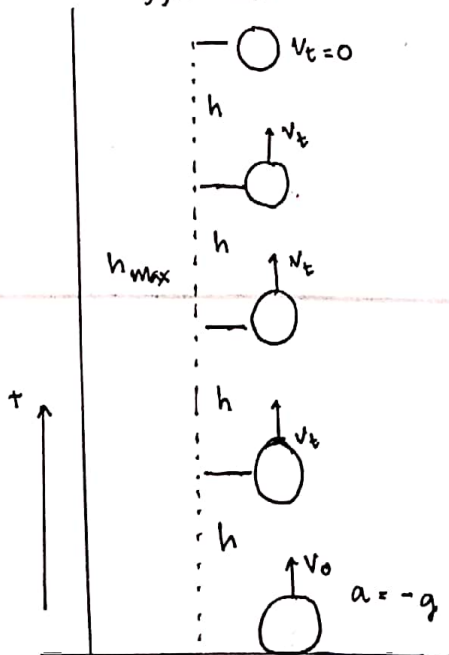
$$t_{\text{udara}} = \frac{2v_0}{g}$$

Grafik



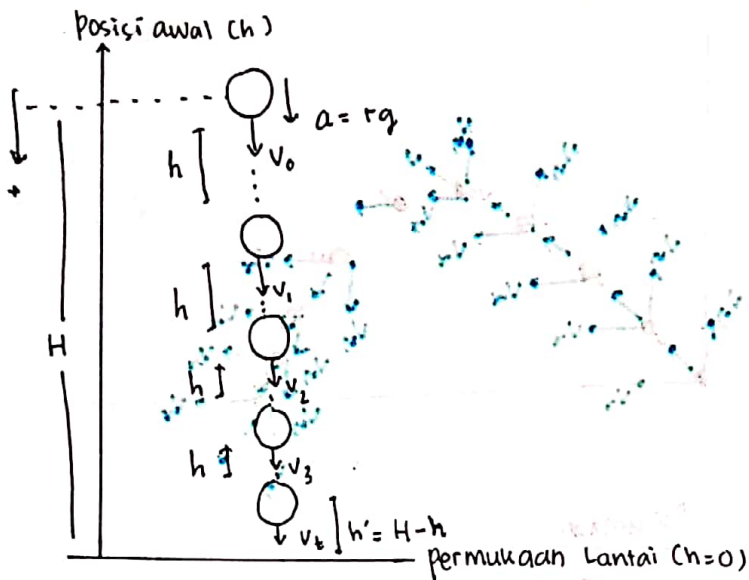
Gerak Vertikal Keatas

Ketinggian (h)



▷ Gerak vertikal ke Bawah (GVB)

Syarat: $v_0 \neq 0$ dan $a = +g$



Persamaan (GVB)

GLBB	$v_t = v_0 + at$	$s = v_0 t + \frac{1}{2} at^2$	$v_t^2 = v_0^2 + 2as$
GVB	$v_t = v_0 + gt$	$h = v_0 t + \frac{1}{2} gt^2$	$v_t^2 = v_0^2 + 2gh$

Grafik

$v \text{ (m/s)}$

v_0

$t \text{ (s)}$

Grafik kecepatan terhadap waktu:

Keterangan:

Untuk grafik yang lainnya sama

Grafik GJB

$v \text{ (m/s)}$

$t \text{ (s)}$

(grafik $v-t$)

$a \text{ (m/s}^2\text{)}$

$t \text{ (s)}$

(grafik $a-t$)

$h \text{ (m)}$

$t \text{ (s)}$

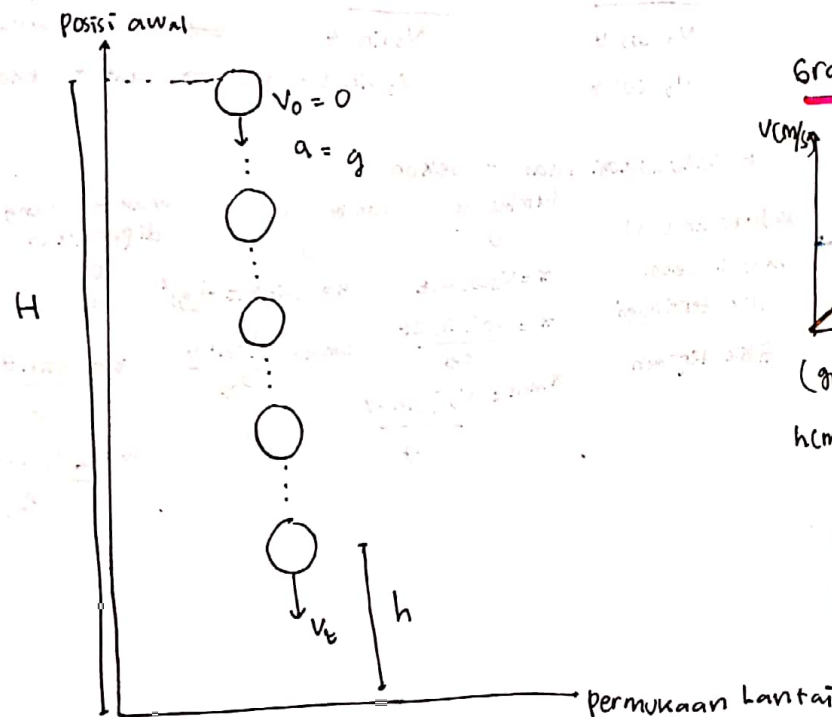
(grafik $h-t$)

$h \text{ (m)}$

$t \text{ (s)}$

(grafik $h'-t$)

▷ Gerak jatuh Bebas



Persamaan GJB

Kecepatan sesaat

$$v_t = v_0 + at ; v_0 = 0, a = g$$

$$v_t = g \cdot t$$

Perpindahan sesaat

$$s = v_0 t + \frac{1}{2} at^2 \quad s = h$$

$$h = \frac{1}{2} gt^2$$

$$t = \sqrt{\frac{2h}{g}}$$

Kecepatan posisi tertentu

$$v_t^2 = v_0^2 + 2as$$

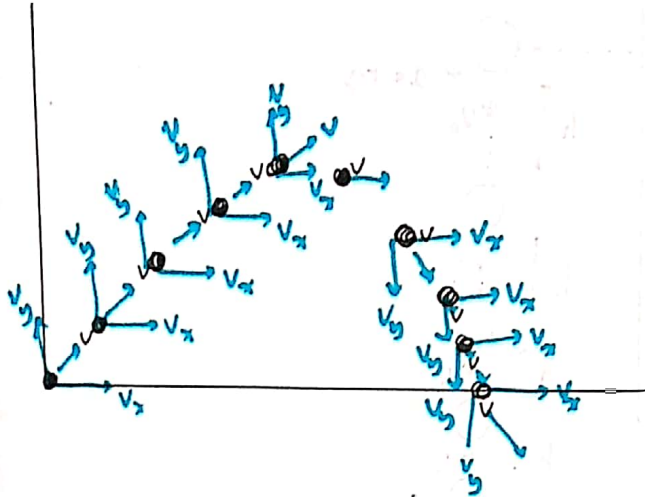
$$v_t^2 = 2gh$$

$$v_t = \sqrt{2gh}$$

Ketinggian diukur dari permukaan Lantai

$$h' = H - \left(\frac{1}{2} gt^2 \right)$$

Gerak parabola



Persamaan

$$V = \sqrt{(V_x)^2 + (V_y)^2}$$

Kecepatan (V_x, V_y)

Sumbu x

$$V_0 \cos \theta$$

$$V_0 \cos \theta$$

Sumbu y

$$V_0 \sin \theta$$

$$V_0 \sin \theta - gt$$

⇒ Kondisi awal

⇒ saat t sekon.

↳ kedudukan saat t sekon

kedudukan awal

saat t sekon

titik tertinggi

titik terjauh

Sumbu x

0

$$x = V_0 \cos \theta \cdot t$$

$$x = \frac{V_0^2 \sin 2\theta}{2g}$$

$$x_{max} = \frac{V_0^2 \sin 2\theta}{g}$$

Sumbu y

0

$$y = V_0 \sin \theta \cdot t - \frac{1}{2}gt^2$$

$$y_{max} = \frac{V_0^2 \sin^2 \theta}{2g}$$

0

waktu yang diperlukan

0

t

$$t = \frac{V_0 \sin \theta}{g}$$

$$t = \frac{2V_0 \sin \theta}{g}$$

Atikkotunnajiah

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