



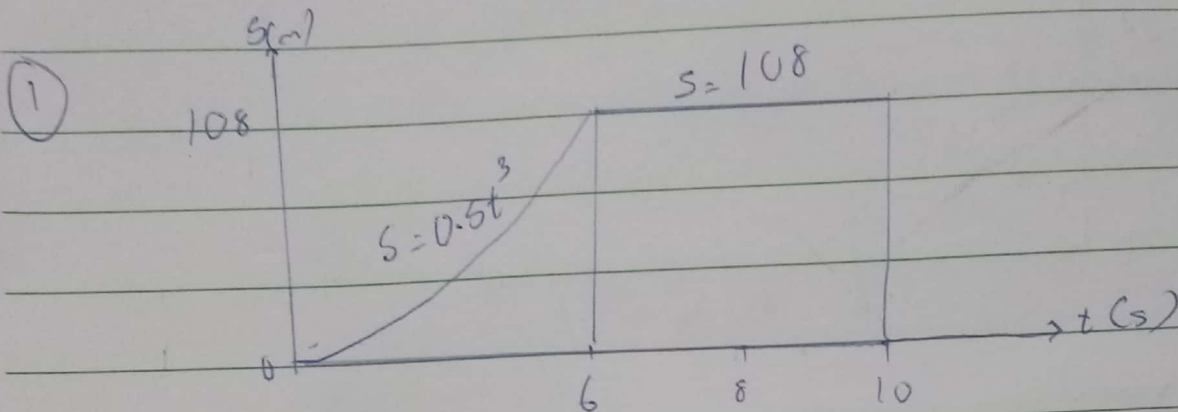
Egbuwe Kelvin Olanide

18/ENGR04/029

Elect - Elect

ENGR 234

Engineering Mechanics II



$$v = \frac{ds}{dt}$$

From $t = 0s - 6s$

$$s = 0.5t^3 \text{ m}$$

$$v = \frac{d(0.5t^3)}{dt}$$

$$v = 1.5t^2 \text{ m/s}$$

at $t = 0s$

$$v = 1.5(0)^2 = 0 \text{ m/s}$$

at $t = 6s$

$$v = 1.5(6)^2 = 54 \text{ m/s}$$

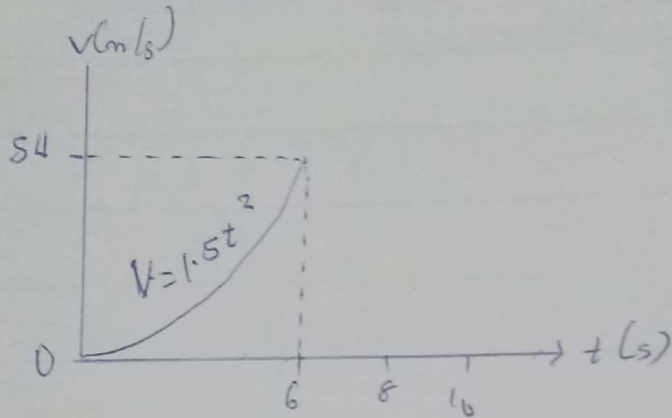
From $t = 6s - 10s$

$$s = 108m$$

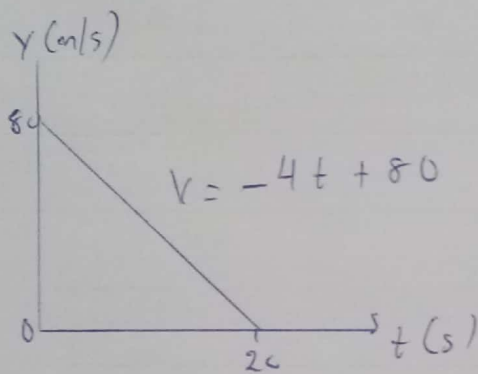
$$v = \frac{d(108)}{dt}$$

$$v = 0m/s$$

V-t graph



(2)



For s-t

$$v = -4t + 80 \text{ m/s}$$

$$s = \int_{t_0}^{t_1} v \cdot dt$$

$$s = \int_0^{20} -4t + 80$$

$$s = \left. \frac{-4t^2}{2} + 80t \right|_0^{20}$$

$$s = -2t^2 + 80t \Big|_0^{20}$$

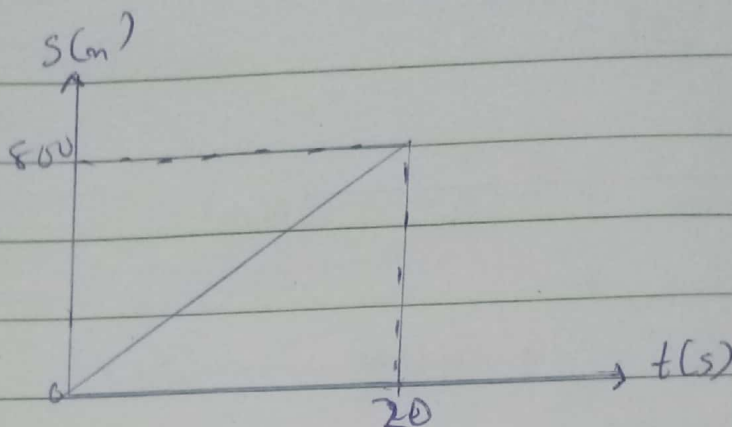
$$s = (-2(20)^2 + 80(20)) - (-2(0)^2 + 80(0))$$

$$s = (-800 + 1600) = 800$$

$$s = 800m$$



s-t graph



For a-t

$$v = -4t + 80 \text{ m/s}$$

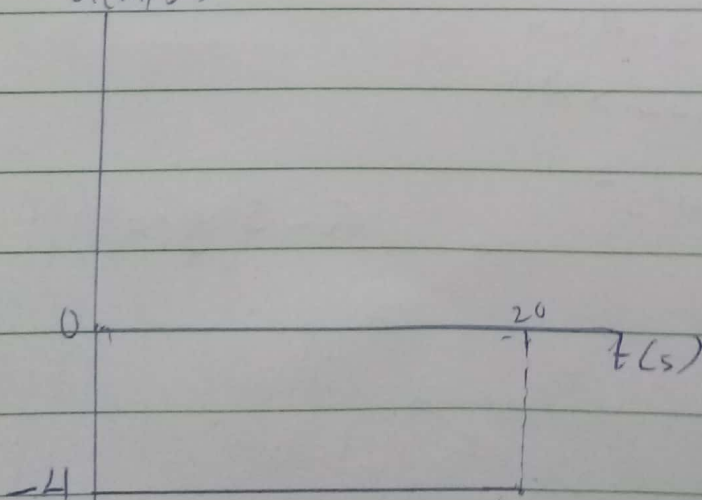
$$a = \frac{dv}{dt}$$

$$a = \frac{d(-4t + 80)}{dt}$$

$$a = -4 \text{ m/s}^2$$

a(m/s²)

a-t graph

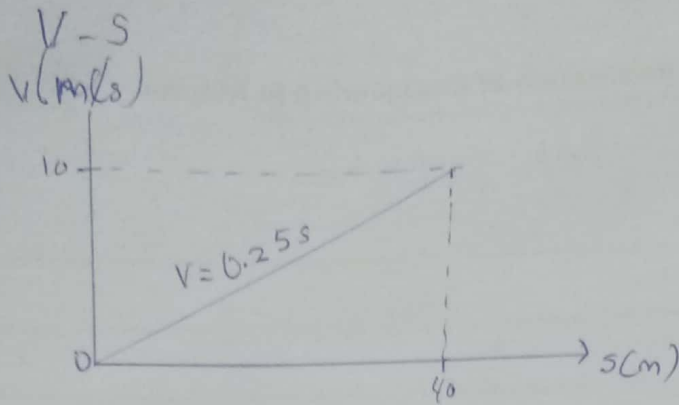


THEME
Entrepreneurship and Manufacturing in Nigeria:
Challenges and Opportunities for a Better Future

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9:00AM DAILY

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For a-s

$$v = 0.25s, \quad s = 40\text{m}$$

$$a = \frac{dv}{dt}, \quad v = \frac{ds}{dt}$$

$$\frac{dv}{dt} = \frac{dv}{ds} \times \frac{ds}{dt}$$

$$\frac{dv}{dt} = \frac{d(0.25s)}{ds}$$

$$\frac{dv}{ds} = 0.25, \quad \frac{ds}{dt} = 0.25s$$

$$\frac{dv}{dt} = 0.25 \times 0.25s$$

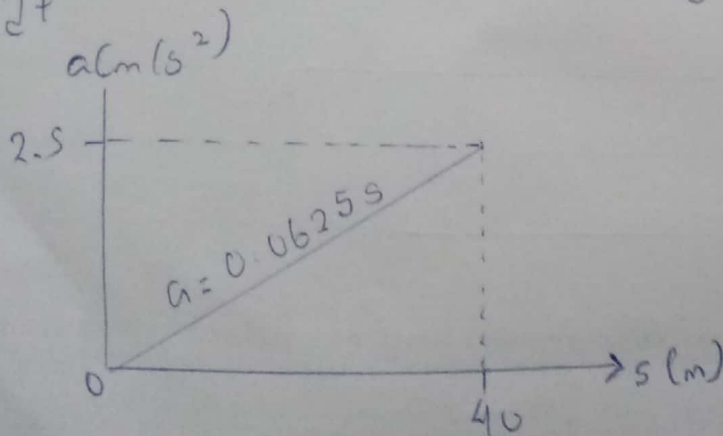
$$\frac{dv}{dt} = 0.0625s \text{ m/s}$$

when $s = 40\text{m}$

$$\frac{dv}{dt} = 0.0625 \times 40$$

$$a = \frac{dv}{dt} = 2.5 \text{ m/s}^2$$

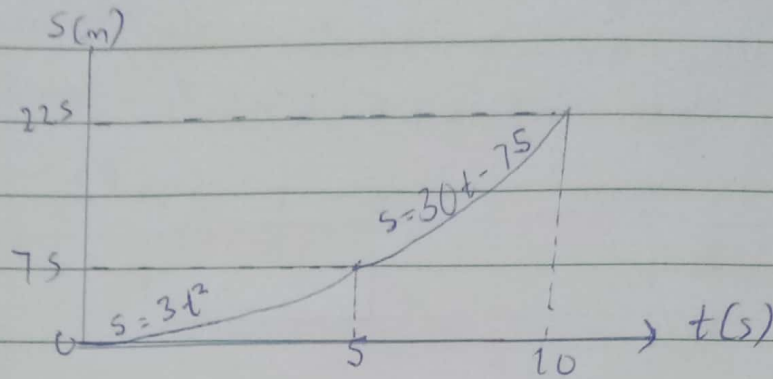
a-s graph





④

$s - t$



$$0 \leq t \leq 10s$$

$$For \quad r - t$$

$$V = \frac{ds}{dt}$$

$$For \quad t = 0s - 5s$$

$$s = 3t^2$$

$$V = \frac{d(3t^2)}{dt}$$

$$V = 6t \text{ m/s}$$

$$\text{When } t = 0s$$

$$V = 6(0) = 0 \text{ m/s}$$

$$\text{When } t = 5s$$

$$V = 6(5) = 30 \text{ m/s}$$

$$For \quad t = 5s - 10s$$

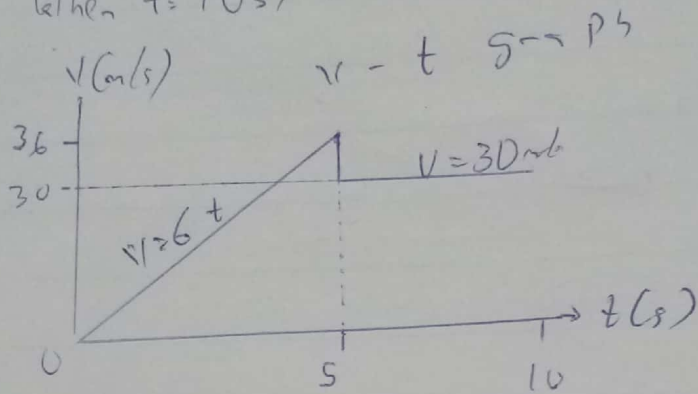
$$S = 30t - 75 \text{ m}$$

$$v = \frac{d(30t - 75)}{dt}$$

$$v = 30$$

ketika $t = 5 \text{ s}$, $v = 30 \text{ m/s}$

ketika $t = 10 \text{ s}$, $v = 30 \text{ m/s}$



For $a - t$ graph

$$a = \frac{dv}{dt}$$

For $t = 0 \text{ s} - 5 \text{ s}$

$$v = 6t$$

$$a = \frac{d(6t)}{dt}$$

$$a = 6 \text{ m/s}^2$$

ketika $t = 0 \text{ s}$, $a = 6 \text{ m/s}^2$

ketika $t = 5 \text{ s}$, $a = 6 \text{ m/s}^2$

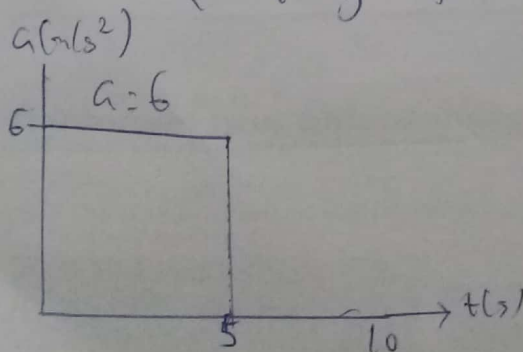
For $t = 5 \text{ s} - 10 \text{ s}$

$$v = 30$$

$$a = \frac{d(30)}{dt}$$

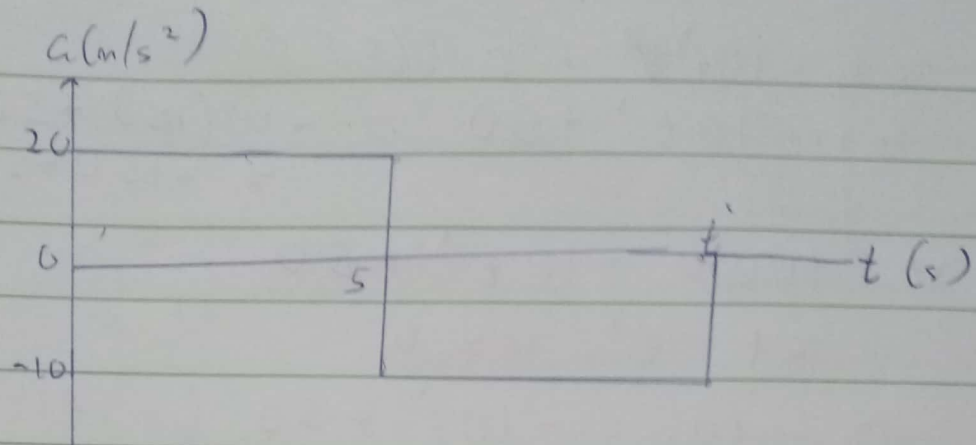
$$a = 0 \text{ m/s}^2$$

$a - t$ graph





5)



For $v-t$

For $t = 0s - 5s$

$$a = 20 \text{ m/s}^2$$

$$v = \int_{t_0}^{t_1} a \cdot dt$$

$$v = \int_0^5 20$$

$$v = 20t \Big|_0^5$$

$$v = 20(5) - 20(0)$$

$$v = 100 \text{ m/s}$$

For $t = 5s - t'$

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

$$v = \int_{t_0}^{t_1} a \cdot dt$$

$$v = \int -10 dt$$

$$v = -10t \Big|_0^{t'}$$

$$v = -10t' - (-10(5))$$

$$v = -10t' + 50 = -10(15) + 50 = -150 + 50 = -100$$

$$v - 100 = -10t' + 50$$

$$\text{at } t', v = 0$$

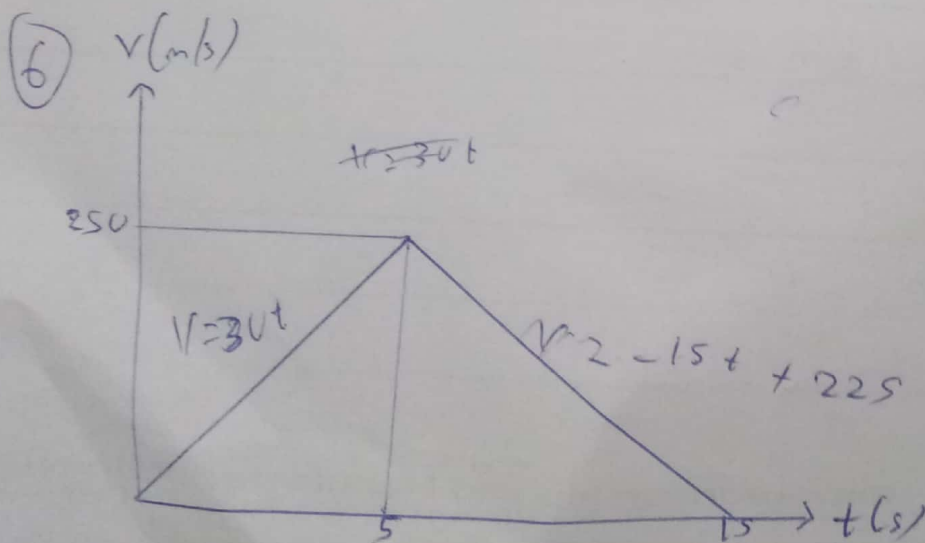
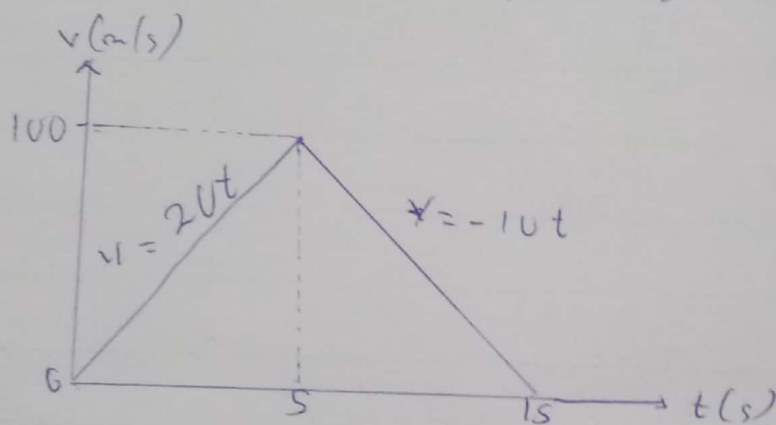
$$0 - 100 = -10t' + 50$$

$$10t' = 50 + 100$$

$$10t' = 150$$

$$t' = 15s$$

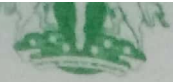
v-t graph



for $t = 0s - 5s$

$$v = 30t$$

$$s = \int_{t_0}^{t_1} v \cdot dt$$



$$S = \int_0^5 30t$$

$$S = \frac{30t^2}{2} \Big|_0^5 = 15t^2 \Big|_0^5$$

$$S = 15(5)^2 - 15(0)^2$$

$$S = 375m$$

$$\text{for } t = 5 - 15s$$

$$v = -15t + 225$$

$$S = \int_5^{15} -15t + 225$$

$$S = \left. \frac{-15t^2}{2} + 225t \right|_5^{15}$$

$$S = \left(\frac{-15(15)^2}{2} + 225(15) \right) - \left(\frac{-15(5)^2}{2} + 225(5) \right)$$

$$S = 1687.5 - 937.5$$

$$S = 750m$$

$$\text{Total distance} = 375 + 750 = 1125m$$



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s-t graph

