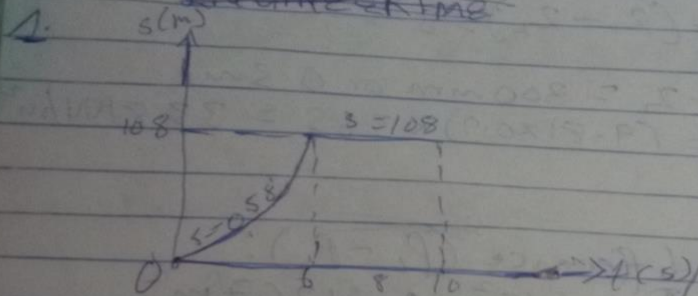


TIMOTHY-JACOB MIYENSEIGHA MARVELLOUS
 COMPUTER ENGINEERING
 15/ENB02/094
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$$v = \frac{ds}{dt}$$

$$v = 1.5t^2$$

at $t = 6s$

$$v = 1.5 \times 6^2$$

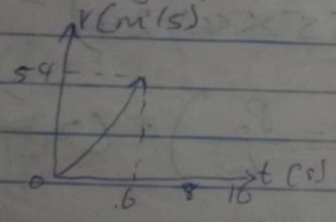
$$= 1.5 \times 36$$

$$v = 54 \text{ m/s}$$

from $t = 6s - 10s$, $s = 108$

$$\therefore v = 0$$

v-t graph



2.) i) $s = \int v dt$

$$s = \int (-4t + 80) dt$$

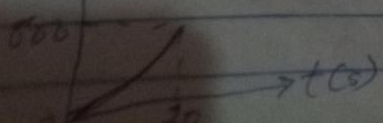
$$s = -2t^2 + 80t$$

at $t = 20s$

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

$$s = 1600 - 800 = 800 \text{ m}$$

s-t graph



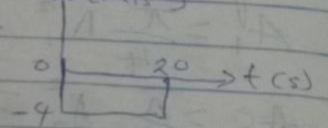
ii) acceleration

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

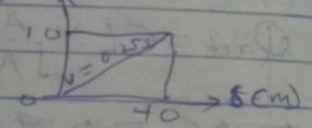
$$a = -4 \text{ m/s}^2$$

at $t = 20s$, $a = -4 \text{ m/s}^2$

a-t graph



3) v-s graph



$$a = \left(\frac{dv}{ds} \right) v$$

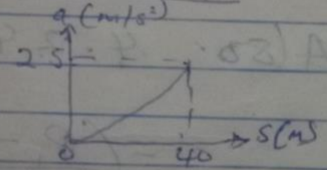
$$v = 0.25s$$

$$a = 10 \times \left(\frac{dv}{ds} \right) v$$

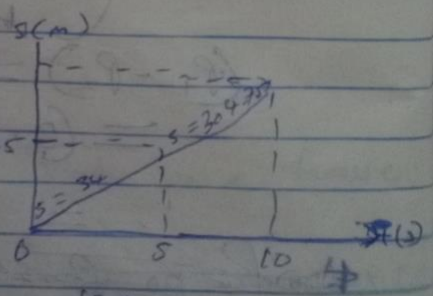
$$a = 10 \times 0.25s$$

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

a-s graph



4)



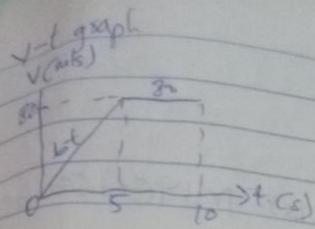
i) $v = \frac{ds}{dt}$ at $t = 5s$

$$v = 6t = 6 \times 5 = 30 \text{ m/s}$$

at $t = 10s$

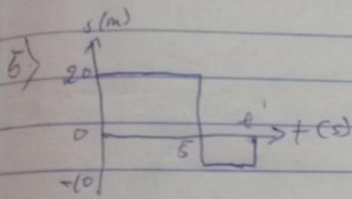
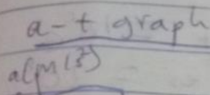
$$v = 30 \text{ m/s}$$

ARV ELLONS



1) $a = \frac{dv}{dt}$ at $t=5s$
 $a = 6 \text{ m/s}^2$

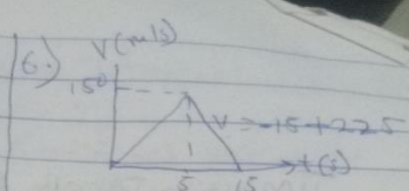
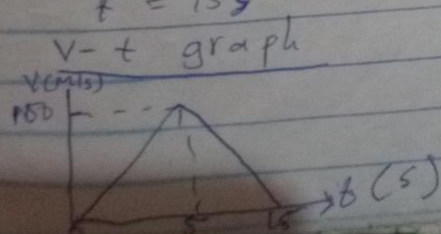
at $t=10s$
 $a = 0 \text{ m/s}^2$



2) $v = \int a dt$
 $v = \int 20 dt$
 $v = 20t$
 at $t=5s$
 $v = 20 \times 5 = 100 \text{ m/s}$
 $5s < t < 10s$

$\int_{100}^v Av = \int_{5}^{t'} -10 dt$
 $v - 100 = -10t' + 50$
 $v - 150 = -10t' + 10(5)$

$v - 100 = -10t' + 50$
 at $t', v=0$
 $0 - 150 = -10t' + 50$
 $10t' = 150$
 $t' = 15s$



$0 \leq t \leq 5$
 $v = 30t$
 $\int_0^5 ds = \int_0^5 30t dt$
 $s = 15t^2$
 $s = 15(5)^2 = 15(25)$
 $s = 375 \text{ m}$

$5 \leq t \leq 15$
 $v = -15t + 225$
 $\int_{375}^s ds = \int_5^{15} (-15t + 225) dt$
 $s - 375 = \frac{-15t^2}{2} + 225t \Big|_5^{15}$
 $s - 375 = \left[\frac{-15(15)^2}{2} + 225(15) \right] - \left[\frac{-15(5)^2}{2} + 225(5) \right]$
 $s - 375 = \left[\frac{-15 \times 225 + 3375}{2} \right] - \left[\frac{-15 \times 25 + 1125}{2} \right]$

$s - 375 = \frac{(-1687.5 + 3375) - (-187.5 + 1125)}{2}$
 $s - 375 = \frac{+1687.5 - 937.5}{2}$
 $s - 375 = 750$
 $s = 1125 \text{ m}$

