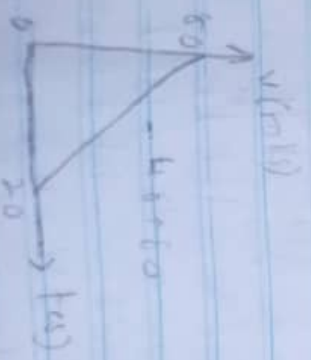
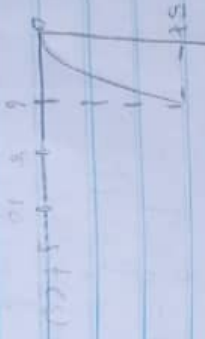




(i)  
 $v = \frac{ds}{dt}$   
 $v = 1.5t^2$   
 at  $t = 6$   
 $v = 1.5 \times 36$   
 $= 54 \text{ m/s}$   
 from  $t = 6 \text{ s} - 10 \text{ s}$   
 $S = 108$   
 $\therefore v = 0$

v-t graph



$s = \int v dt$   
 $s = \int_0^{20} (-4t + 80) dt$   
 $s = -2t^2 + 80t$   
 at  $t = 20$   
 $s = -2(20)^2 + 80(20)$   
 $s = 1600 - 800 = 800 \text{ m}$   
s-t graph



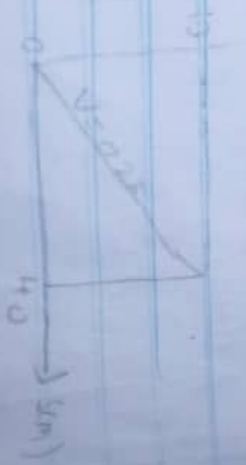
(ii) acceleration

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

a-t graph



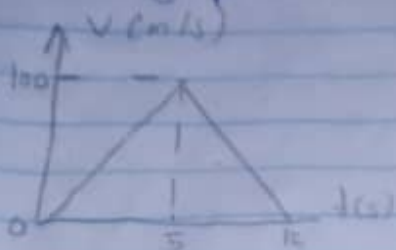
(iii) acceleration



$$10t = 150$$

$$t = 15s$$

V-t graph



$$S = 375 = \left[ \frac{15(15)^2 + 225(15)}{2} \right] - \left[ \frac{15(5)^2 + 225(5)}{2} \right]$$

~~S = 375~~

$$S = 375 = \left[ \frac{-15 \times 225 + 3750}{2} \right] - \left[ \frac{-15 \times 25 + 1125}{2} \right]$$

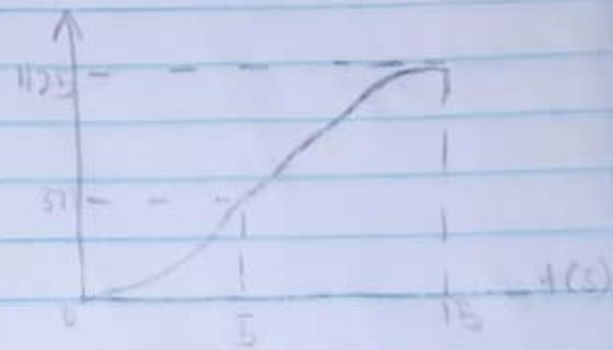
$$S = 375 = [-1687.5 + 3750] - [-187.5 + 1125]$$

$$S = 375 = 1687.5 - 937.5$$

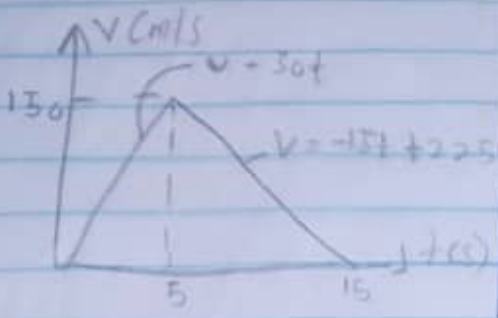
$$S = 375 = 750$$

$$S = 1125m$$

S-t graph



6



$$0 \leq t \leq 5$$

$$V = 30t$$

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

$$S = 15t^2 \Big|_0^5$$

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

$$S = 15 \times 25$$

$$S = 375m$$

$$5 \leq t \leq 15$$

$$V = -15t + 225$$

$$\int_{375}^{1125} ds = \int_5^{15} (-15t + 225) dt$$

$$S = 375 = \left. \frac{-15t^2}{2} + 225t \right|_5^{15}$$

$$a = [dv/ds]v$$

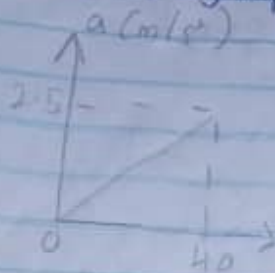
$$v = 0.25s$$

$$a = 1 \times d(0.25s)/ds$$

$$a = 1 \times 0.25$$

$$a = 0.25 \text{ m/s}^2$$

a-s graph



$$(ii) a = dv/dt$$

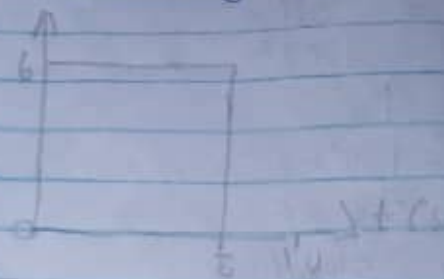
$$\text{at } t = 5s$$

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

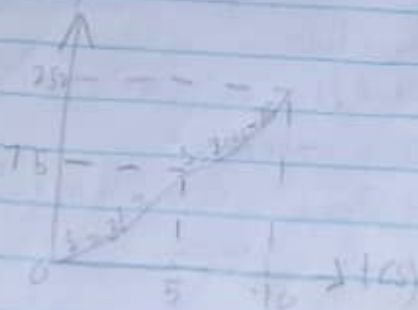
$$\text{at } t = 10s$$

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

a-t graph



4)



$$v = ds/dt$$

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

$$v = 6t = 6 \times 5$$

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

$$\text{at } t = 10s$$

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

v-t graph



(5)



$$(i) v = \int a dt$$

$$v = \int 20 dt$$

$$v = 20t$$

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

$$v = 20 \times 5 = 100 \text{ m/s}$$

$$\int_{100}^v dv = \int_5^t -10 dt$$

$$v - 100 = -10t + 50$$

$$v - 100 = -10t + 50$$

$$v - 100 = -10t + 50$$

$$\text{at } t = 10s, v = 0$$

$$0 - 100 = -10t + 50$$