

$$0 \leq t \leq 5$$

$$v = 50t$$

$$\int_0^5 ds = \int_0^5 50t dt$$

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

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

$$s = 15 \times 25$$

$$s = 375 \text{ m}$$

$$5 \leq t \leq 15$$

$$v = -10t + 225$$

$$s - 375 = -\frac{10t^2}{2} + 225t \Big|_5^{15}$$

$$s - 375 = \left[ -\frac{10(15^2)}{2} + 225(15) \right] - \left[ -\frac{10(5^2)}{2} + 225(5) \right]$$

$$s - 375 = \left[ -\frac{10 \times 225}{2} + 3375 \right] - \left[ -\frac{10 \times 25}{2} + 1125 \right]$$

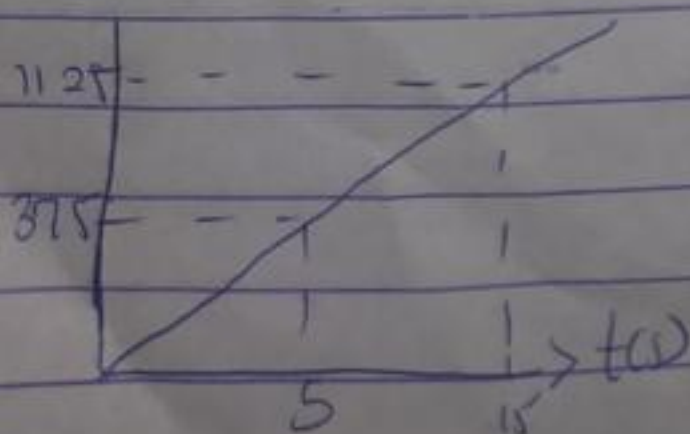
$$s - 375 = (-1125 + 3375) - (-125 + 1125)$$

$$s - 375 = +1687.5 - 487.5$$

$$s - 375 = 750$$

$$s = 1125 \text{ m}$$

S-t graph



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

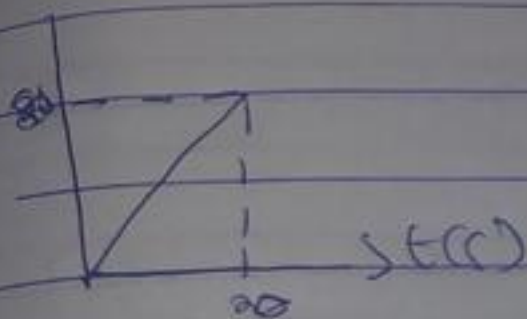
$$s = -2t^2 + 80t$$

at  $t = 20$

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

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

s-t graph



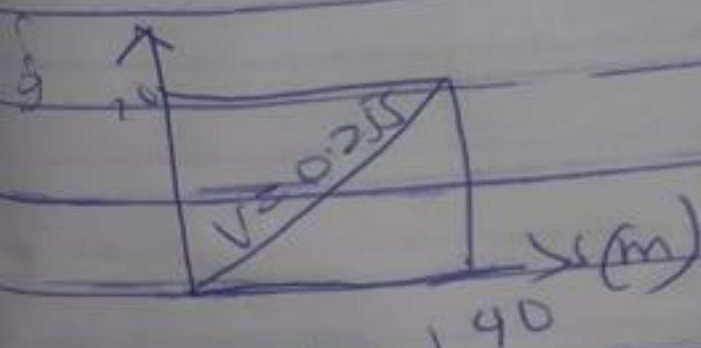
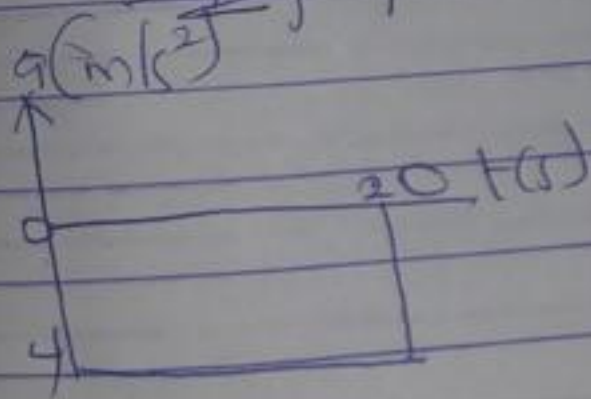
① acceleration

$$a = dv/dt$$

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

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

a-t graph



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

$$v = 0.25s$$

$$a = 10 \times d(0.25s)/ds$$

$$a = 10 \times 0.25$$

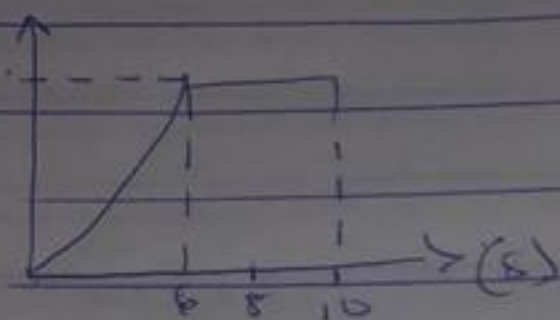
$$a = 2.5 \text{ m/s}^2$$



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

$$v = 1.5t^2$$

$$at = t = 6s$$

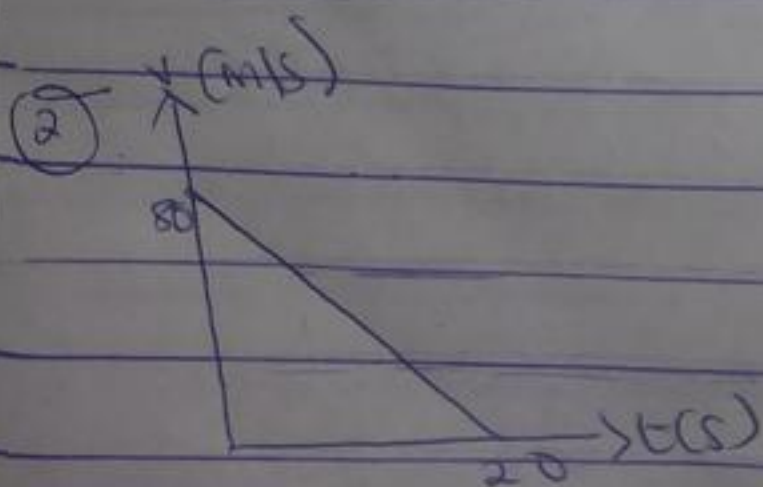
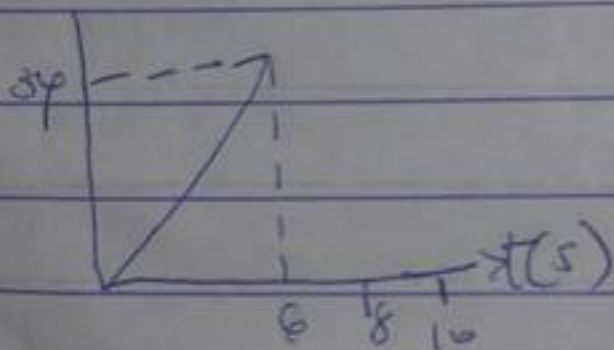
$$v = 1.5 \times 6^2$$

$$v = 1.5 \times 36$$

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

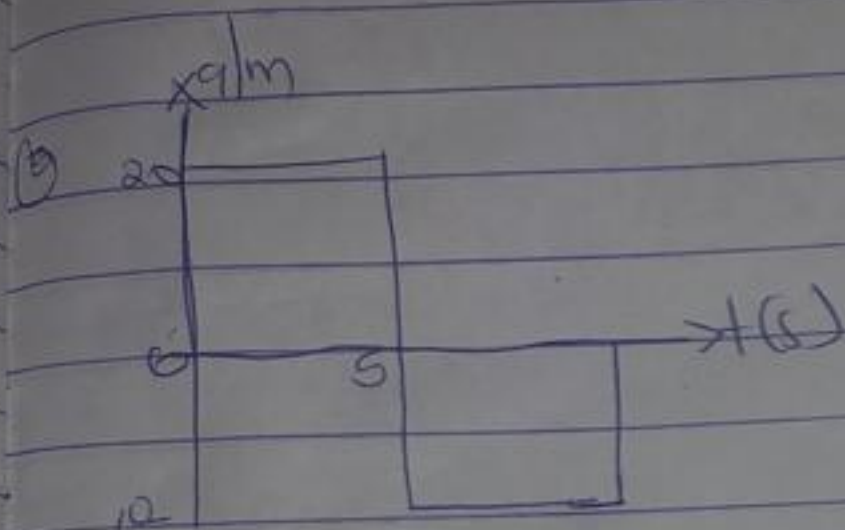
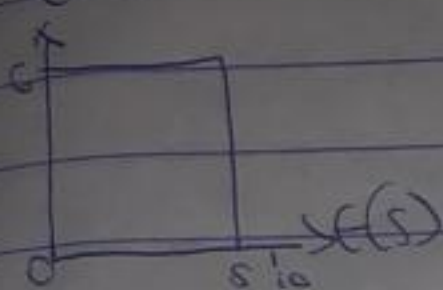
from  $t = 6s - 10s$ ;  $s = 108$   
 $v = 0$

v-t graphs

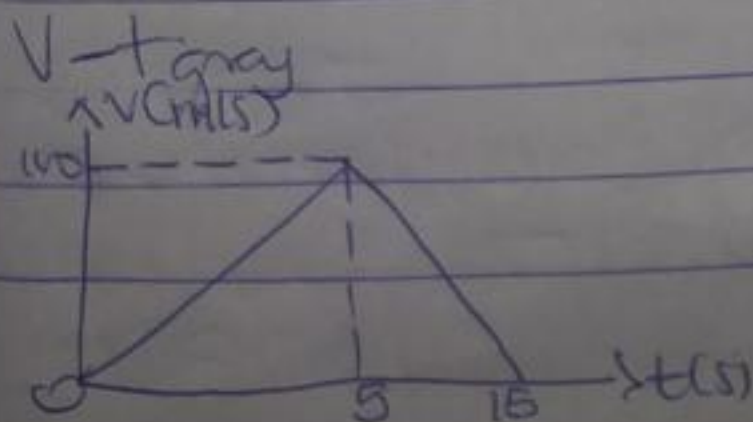


$$s = \int v dt$$

$\dot{q}-t$  graph  
 $q$  (m/s)

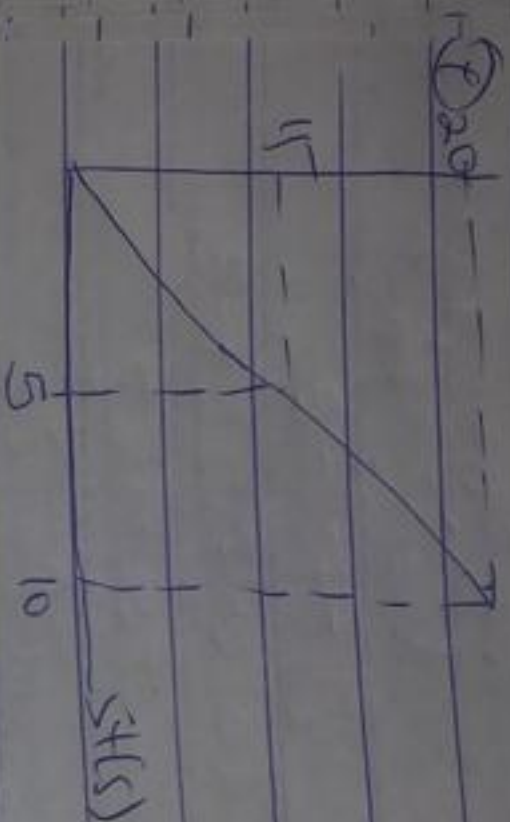
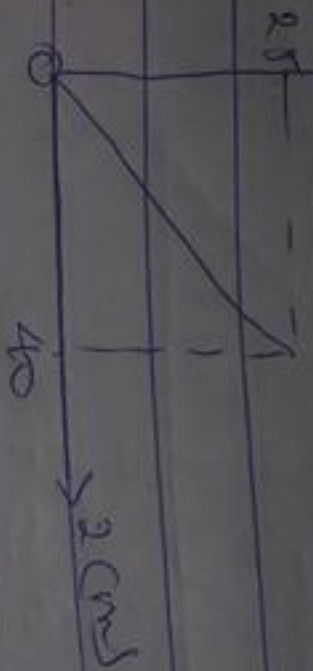


①  $v = \int a dt$   
 $v = \int 20 dt$   
 $v = 20t$   
 at  $t = 5$   
 $v = 20 \times 5 = 100 \text{ m/s}$   
 $5 \text{ s} < t < 15$   
 $\int_{100}^v dv = \int_5^{t'} -10 dx$   
 $v - 100 = -10t' + 50$   
 $v = 100 = -10t' + 50$   
 at  $t' : v = 0$   
 $0 - 100 = -10t' + 50$   
 $10t' = 150$   
 $t' = 15 \text{ s}$





Q - S graph



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

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

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

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

~~v - t graph~~



$$(1) a = \frac{dv}{dt}$$

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

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

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

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