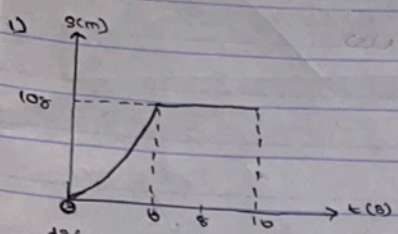


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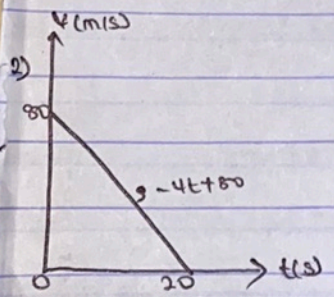
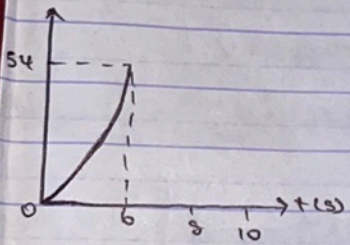
$v = \frac{ds}{dt}$   
 $v = 1.5t^2$   
 at  $t = 6$  s

$v = 1.5 \times 6^2$   
 $= 1.5 \times 36$

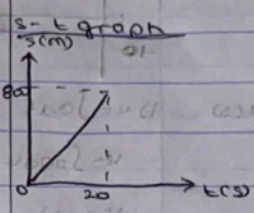
$v = 54 \text{ m/s}$

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

$v-t$  graph.



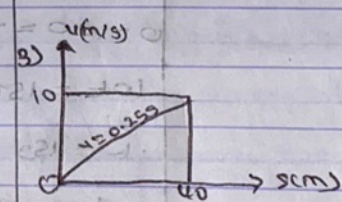
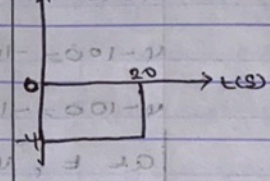
i)  $s = \int v dt$   
 $s = \int (-4t + 80)$   
 $s = -2t^2 + 80t$   
 at  $t = 20$   
 $s = -2(20)^2 + 80(20)$   
 $s = 1600 - 800$   
 $= 800 \text{ m}$



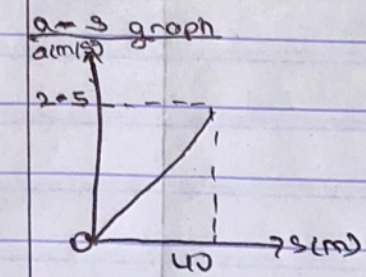
ii) Acceleration  
 $a = \frac{dv}{dt}$

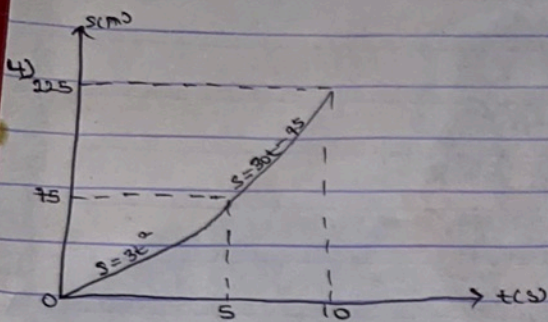
$1 \cdot a = -4 \text{ m/s}^2$   
 at  $t = 20$  s,  $a = -4 \text{ m/s}^2$

$a-s$  graph



$a = \left(\frac{dv}{ds}\right)v$   
 $v = 0.25s$   
 $a = 10 \times \frac{d(0.25s)}{ds}$   
 $a = 10 \times 0.25$   
 $a = 2.5 \text{ m/s}^2$

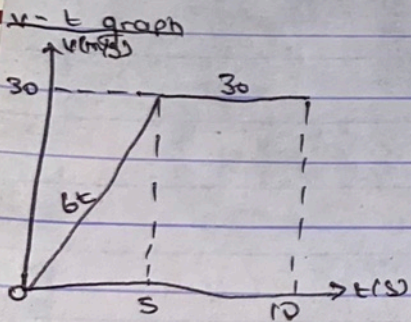




1)  $v = \frac{ds}{dt}$   
 at  $t = 5s$   
 $v = 6t = 6 \times 5$   
 $= 30 \text{ m/s}$

at  $t = 10s$

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



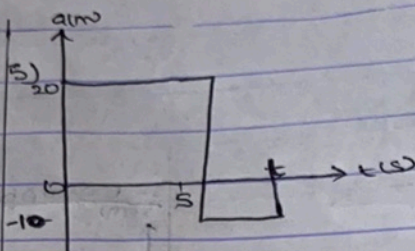
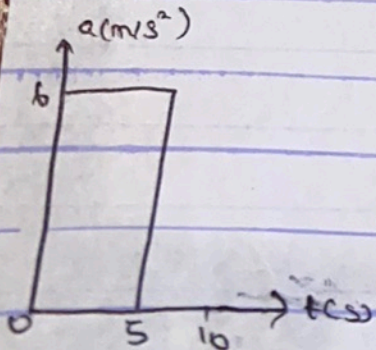
ii)  $a = \frac{dv}{dt}$

at  $t = 5s$

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

at  $t = 10s$

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



1)  $u = \int a dt$

$u = \int 20 dt$

$u = 20t$

at  $t = 5s$

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

$5s < t < 10s$

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

$u - 100 = -10t \Big|_5^t$

$u - 100 = -10t + 10(5)$

$u - 100 = -10t + 50$

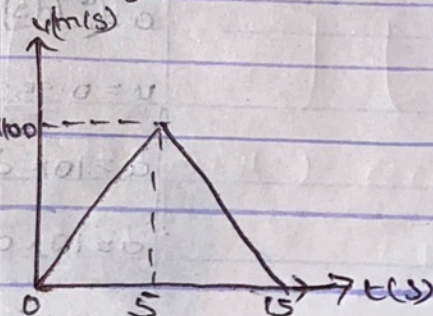
at  $t$ ,  $u = 0$

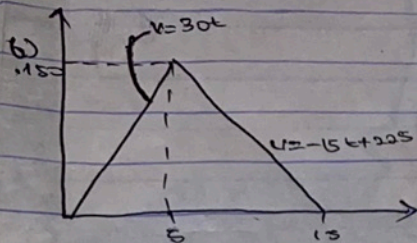
$0 - 100 = -10t + 50$

$10t = 150$

$t = 15s$

$v-t$  graph





$$0 \leq t \leq 5$$

$$v = 30t$$

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

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

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

$$s = 15 + 25$$

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

$$5 \leq t \leq 15$$

$$v = -15t + 225$$

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

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

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

$$s - 375 = \left[ \frac{-15 \times 225}{2} + 3375 \right] - \left[ \frac{-15 \times 25}{2} + 1125 \right]$$

$$s - 375 = (-1687.5 + 3375) - (-187.5 + 1125)$$

$$s - 375 = +1687.5 - 937.5$$

$$s - 375 = 750$$

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

s-t graph

