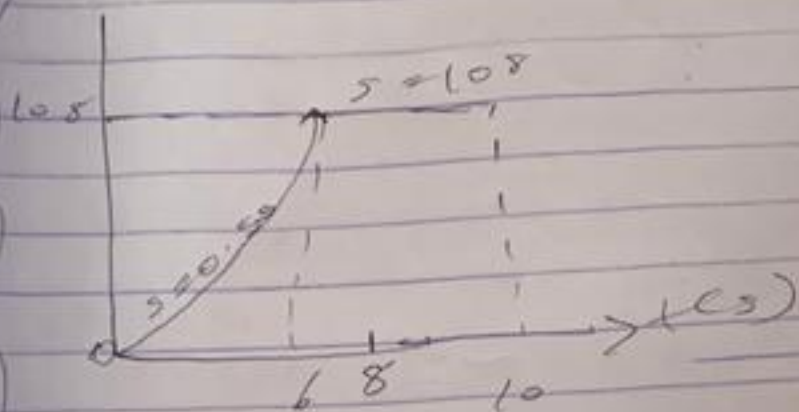


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 Department: Computer engineering



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

$$v = 1.5t^2$$

$$\text{at } t = 6s$$

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

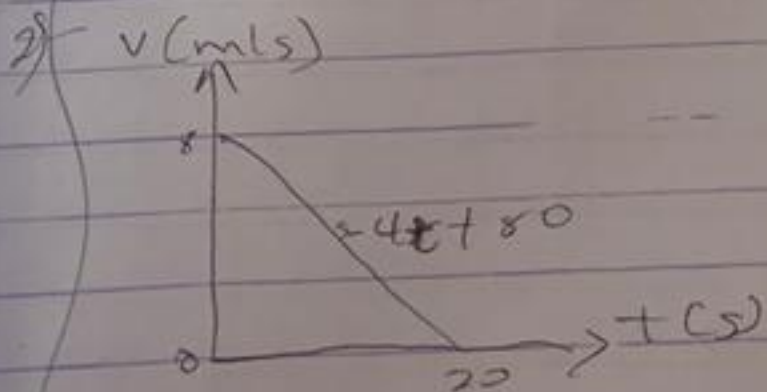
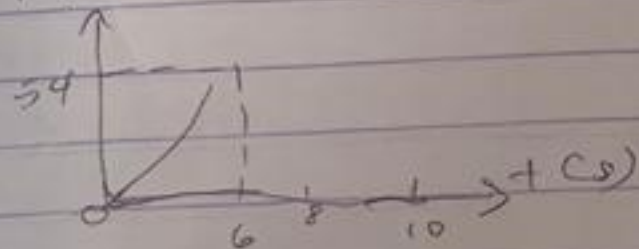
$$v = 54 \text{ m/s}$$

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

$$\therefore v = 0$$

v-t graph

v (m/s)



$$s = \int v dt$$

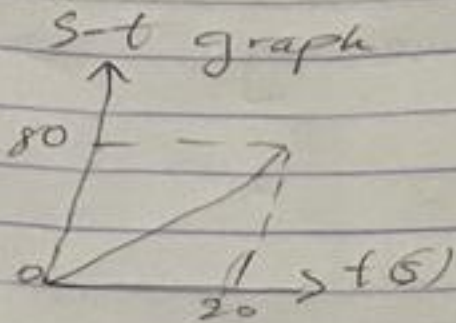
$$s = \int (-4t + 80) dt$$

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

$$\text{at } t = 20s$$

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

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



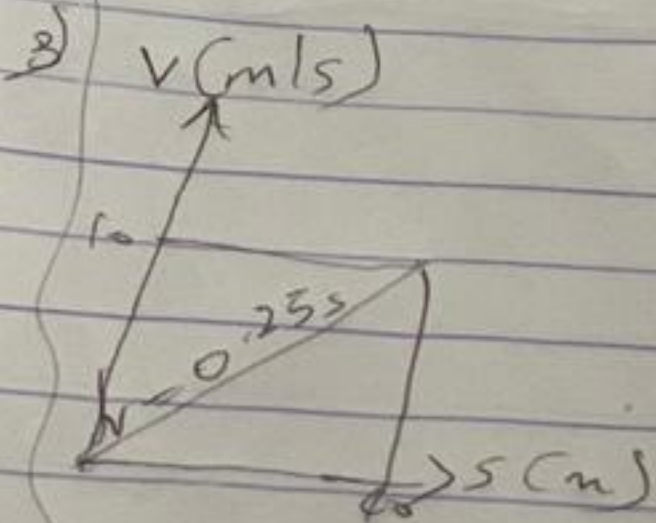
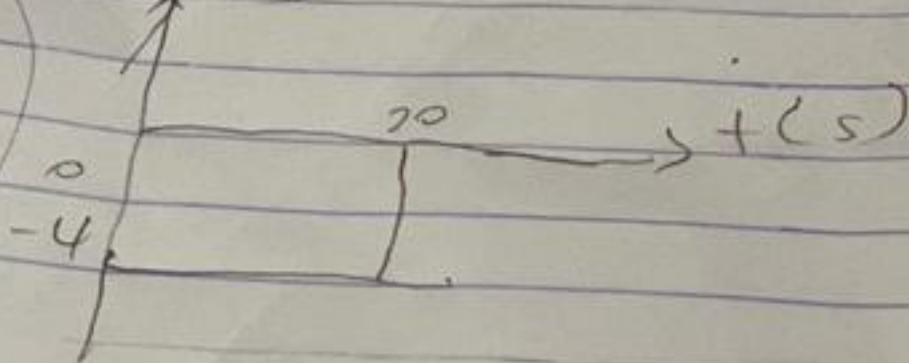
1) Acceleration

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

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

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

a-t graph



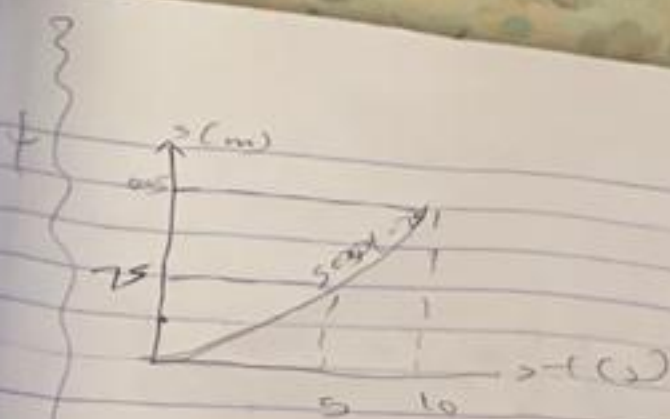
$$a = \left(\frac{dv}{ds} \right) v$$

$$v = 0.25s$$

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

$$a = 10 \times 0.25$$

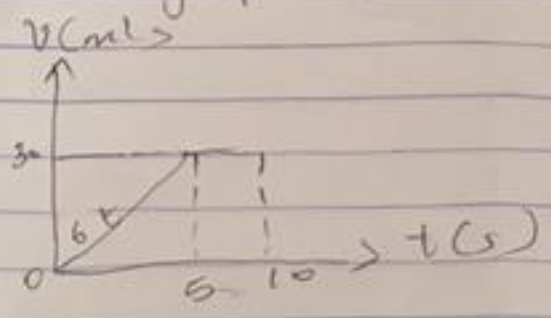
$$a = 2.5 \text{ m/s}^2$$



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

at $t = 5s$
 $v = 6t = 6 \times 5 = 30 \text{ m/s}$
 at $t = 10s$
 $v = 30 \text{ m/s}$

v-t graphs



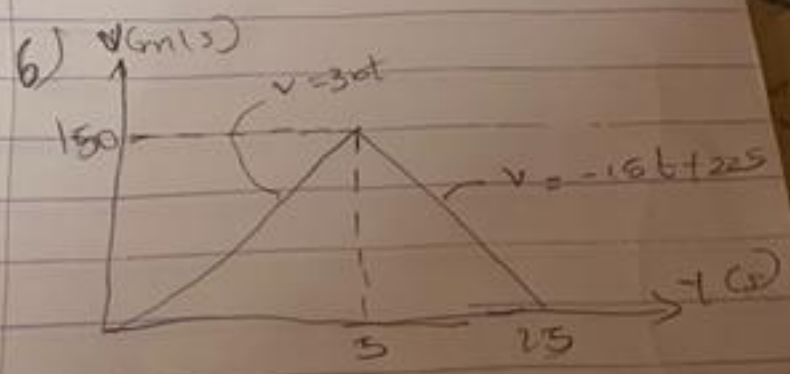
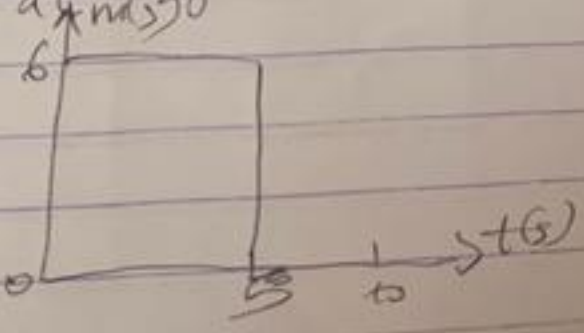
1) $v = \frac{ds}{dt}$
 $v = \int 20t \, dt$
 $v = 20t$
 at $t = 5s$
 $v = 20 \times 5 = 100 \text{ m/s}$
 $5s < t \leq 15s$
 $\int_{100}^0 dv = \int_5^{15} -10 \, dt$
 $v - 100 = -10t \quad | \int$
 $v - 100 = -10t + 10(5)$
 $v - 100 = -10t + 50$
 at $t = 15s$
 $0 - 100 = -10t + 50$
 $(10t) = 150$
 $t = 15s$

v-t graph



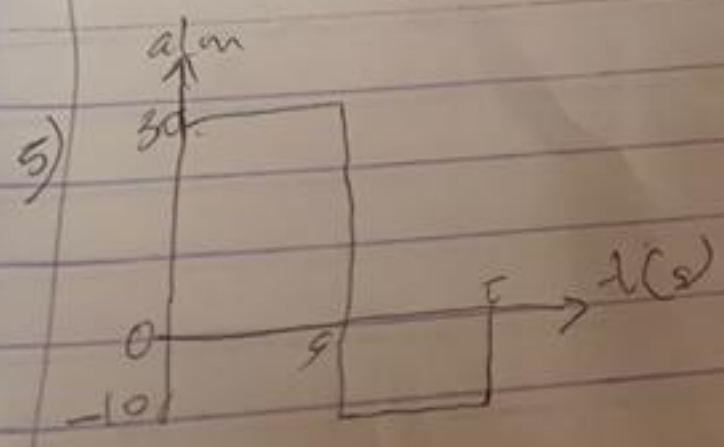
11) $a = \frac{dv}{dt}$
 at $t = 5s$
 $a = 6 \text{ m/s}^2$
 at $t = 10s$
 $a = 0 \text{ m/s}^2$

a-t graph



$0 \leq t \leq 5s$
 $v = 30t$
 $\int_0^3 ds = \int_0^5 30t \, dt$
 $s = 15t^2 \Big|_0^5$
 $s = 15(5)^2 - 15(0)^2$
 $s = 15 \times 25$
 $s = 375 \text{ m}$

$5s \leq t \leq 15s$



$$v = -15t + 225$$

$$\int_{375}^s ds = \int_0^{15} \frac{-15t^2 + 225t}{2} dt$$

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

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

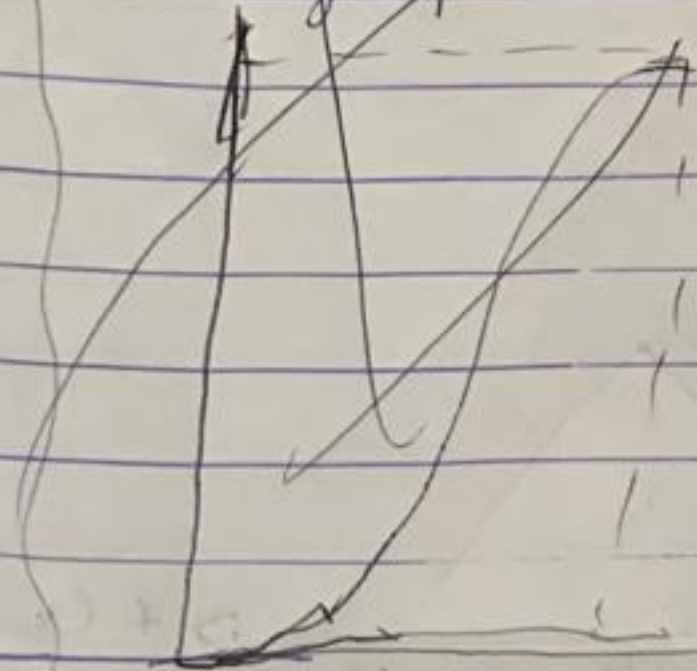
$$s - 375 = (-1687.5 + 3375) - (-187.5s + 1125)$$

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

$$s = 375 = 750$$

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

s-t graph



s-t graph

