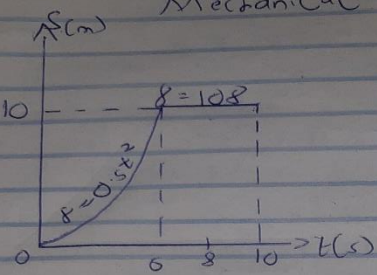


BRAIDE SOGBETE STEVEN

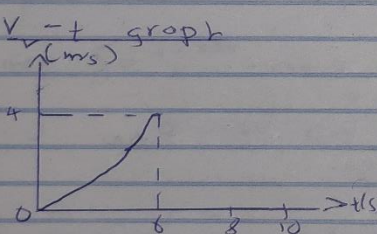
18/ENG06/016

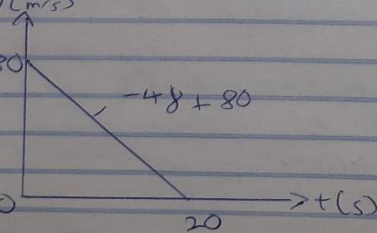
MECHANICAL

Braide Sogbete Steven
18/ENG06/016
Mechanical

1) 

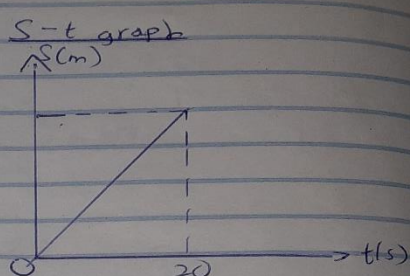
$v = ds/dt$
 $v = 1.5t^2$
 at $t = 6s$
 $v = 1.5 \times 6^2$
 $= 1.5 \times 36$
 $v = 54 \text{ m/s}$
 from $t = 6s - 10s$, $s = 10.8$
 $\therefore v = 10$

$v-t$ graph 

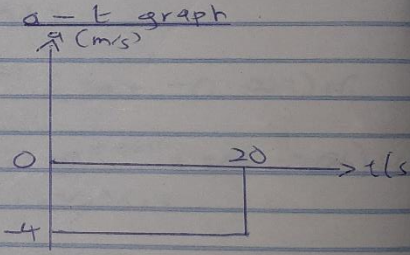
2) 

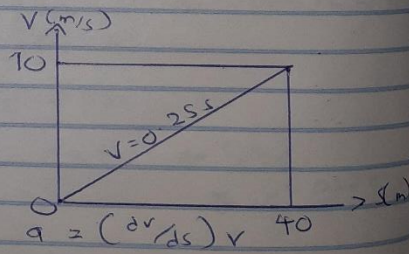
(1) $s = \int v dt$
 $s = \int (-4t + 80) dt$
 $s = -2t^2 + 80t$
 at $t = 20s$

$s = -2(20)^2 + 80(20)$
 $s = 1600 - 800 = 800 \text{ m}$

$s-t$ graph 

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

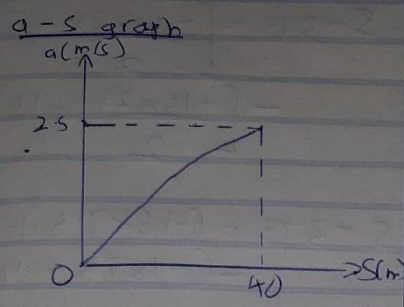
$a-t$ graph 

3) 

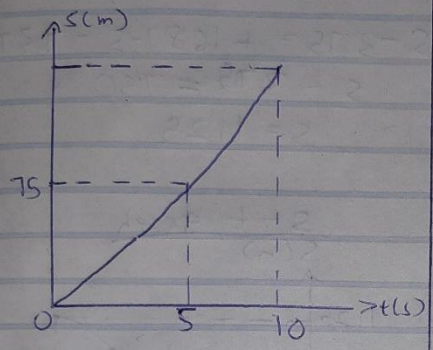
$a = (dv/ds) v$
 $v = 0.25s$
 $a = 10 \times 2(0.25s) / ds$
 $a = 10 \times 0.25$
 $a = 2.5 \text{ m/s}^2$

(1)

20)
20 m



4)
t(s)

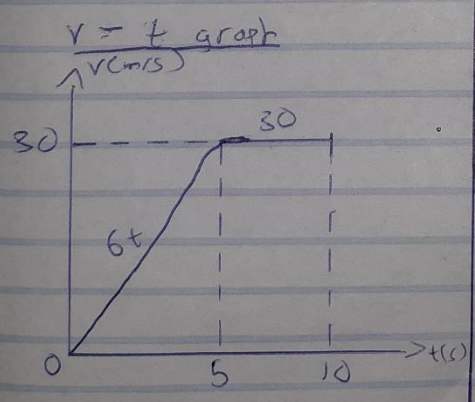


170 m

4 m/s²

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

t(s)

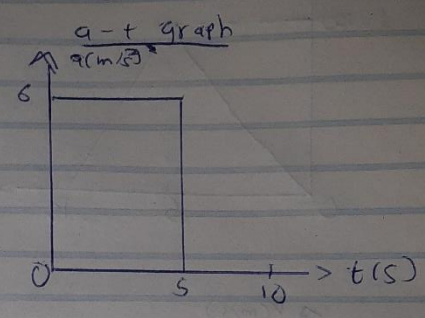


s(m)

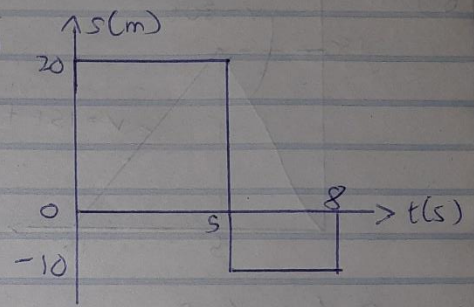
125

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

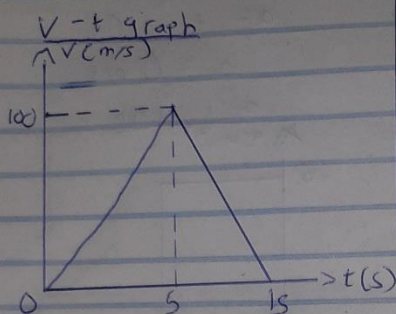
at $t = 10s$
 $a = 0 \text{ m/s}^2$



5)



(i) $v = \int a dt$
 $v = \int 20 dt$
 $v = 20t$
 at $t = 5s$
 $v = 20 \times 5 = 100 \text{ m/s}$
 $5s \leq t \leq t$
 $\int_{100}^v dv = \int_5^t -10 dt$
 $v - 100 = -10t + 10(5)$
 $v - 100 = -10t + 50$
 at $t', v = 0$
 $0 - 100 = -10t + 50$
 $10t' = 150$
 $t' = 15s$



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

$$- \left[\frac{-15 \times 25 + 1125}{2} \right]$$

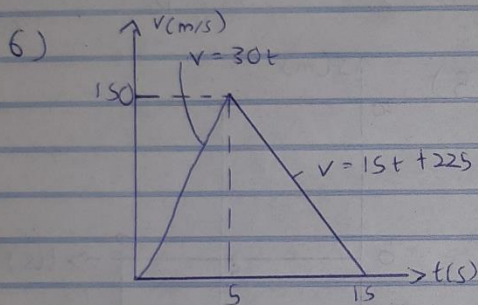
$$S - 375 = (-1687.5 + 3375)$$

$$- (-187.5 + 1125)$$

$$S - 375 = +1687.5 - 937.5$$

$$S - 375 = 750$$

$$S = 1125$$



$$0 \leq t \leq 5$$

$$v = 30t$$

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

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

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

$$s = 15 \times 25$$

$$s = 375_m$$

$$5 \leq t \leq 15_s$$

$$v = -15t + 225$$

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

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

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

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

