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

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

$$s = 15 \times 25$$

$$s = 375m$$

$$5s \leq t \leq 15s$$

$$v = -15t + 225$$

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

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

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

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

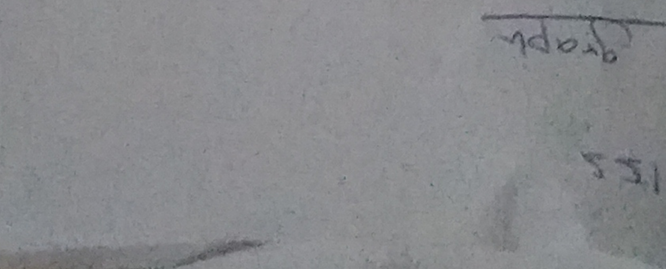
$$s - 375 = 750$$

$$s = 1125m$$

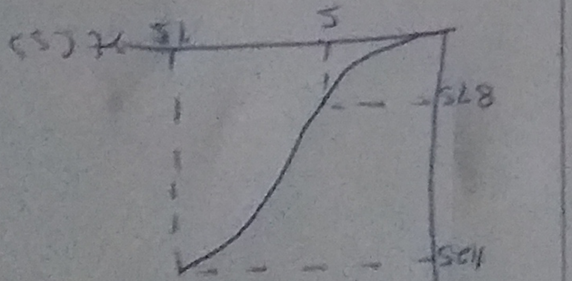
5)

$$t = 15s$$

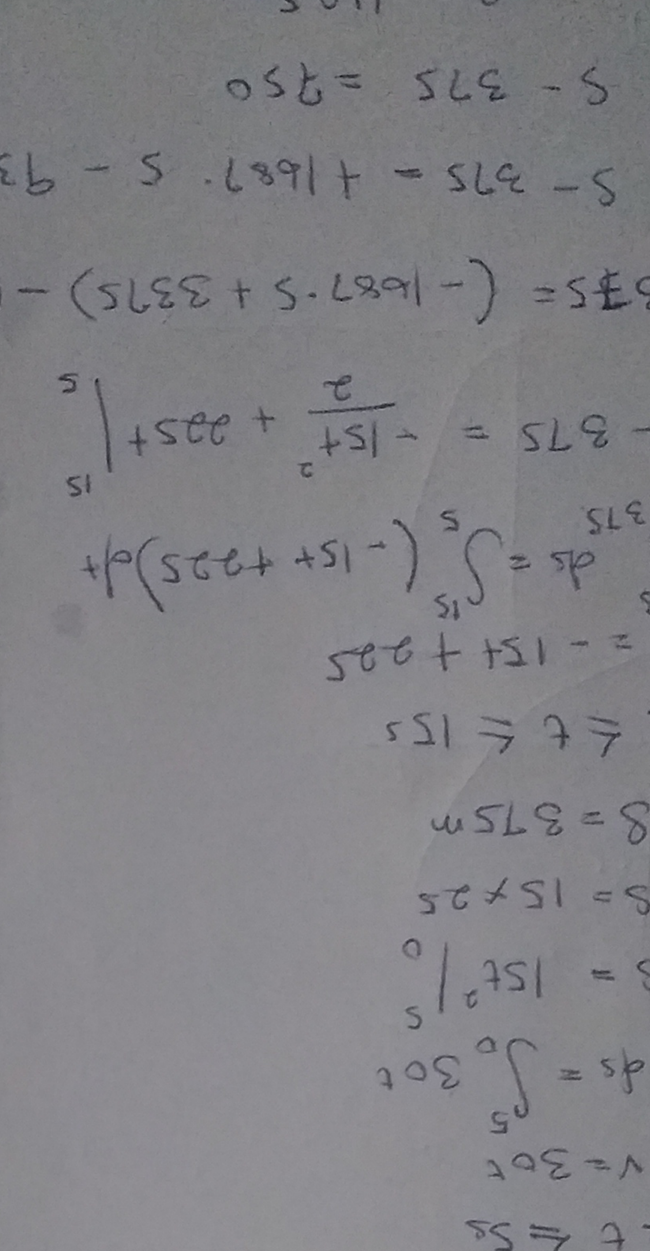
v-t graph



s-t graph

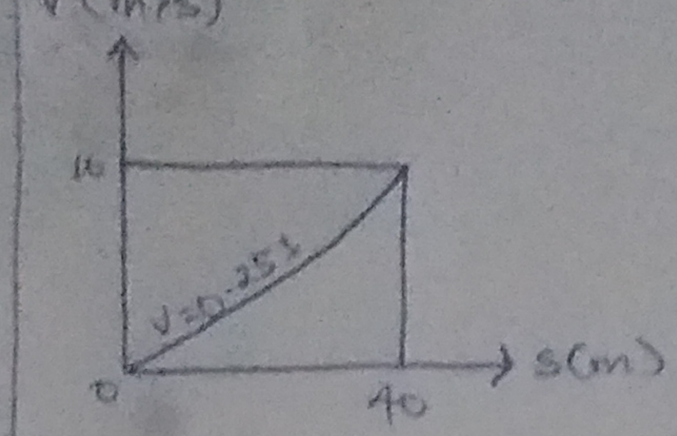


b)



$$0 \leq t \leq 5s$$

$$v = 30t$$

3) 

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

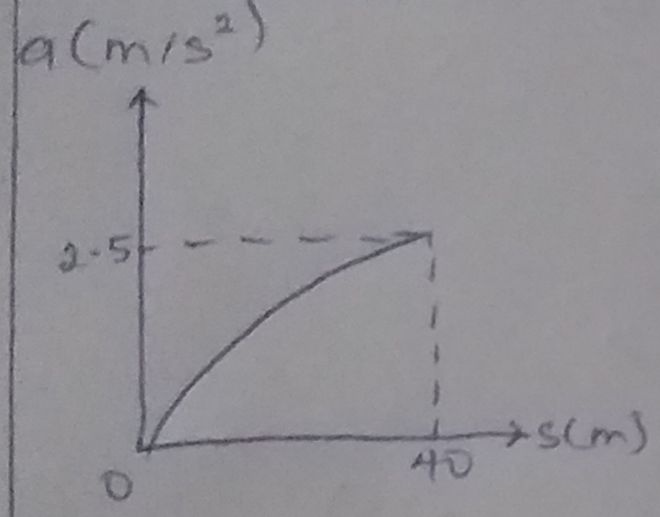
$v = 0.25s$

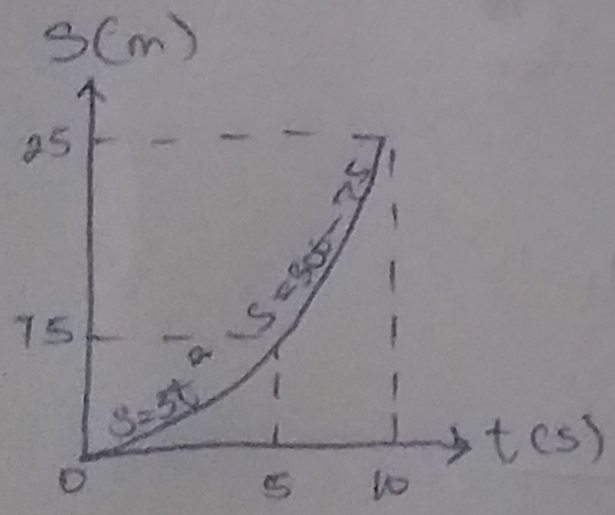
$a = 10 \times d/ds(0.25s)/ds$

$a = 10 \times 0.25$

$a = 2.5 m/s^2$

a-s graph



4) 

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

at $t = 5s$

$v = 6t = 6 \times 5$

$= 30 m/s$

at $t = 10s$

$v = 80 m/s$

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

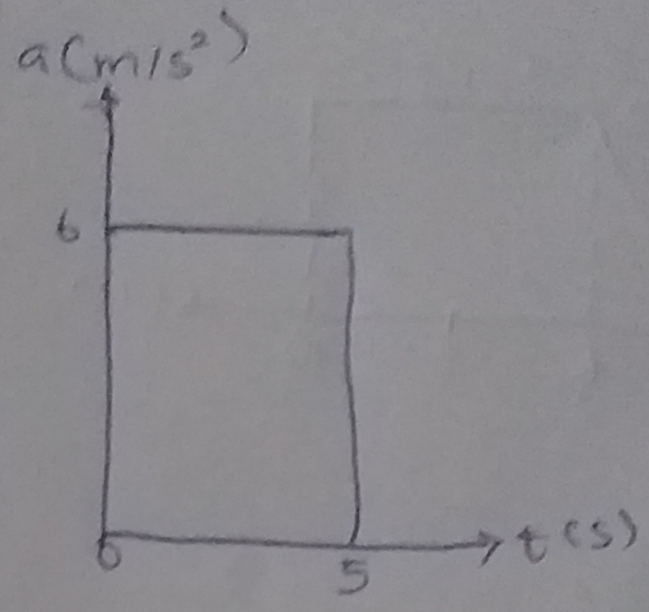
at $t = 5s$

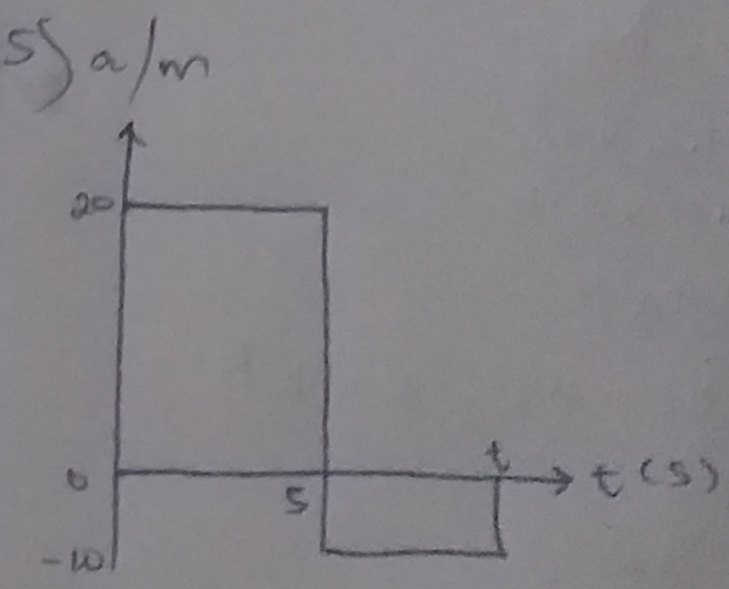
$a = 6 m/s^2$

at $t = 10s$

$a = 0 m/s^2$

a-t graph



5) 

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

$v = \int 20\,dt$

$v = 20t$

at $t = 5s$

$v = 20 \times 5 = 100 m/s$

$5s < t \leq t'$

$\int_{100}^{v} dv = \int_{5}^{t} -10\,dt$

$v - 100 = -10t \int_{5}^{t}$

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

$v - 100 = -10t' + 50$

at t', $v = 0$

$0 - 100 = -10t + 50 \therefore 10t' = 150$

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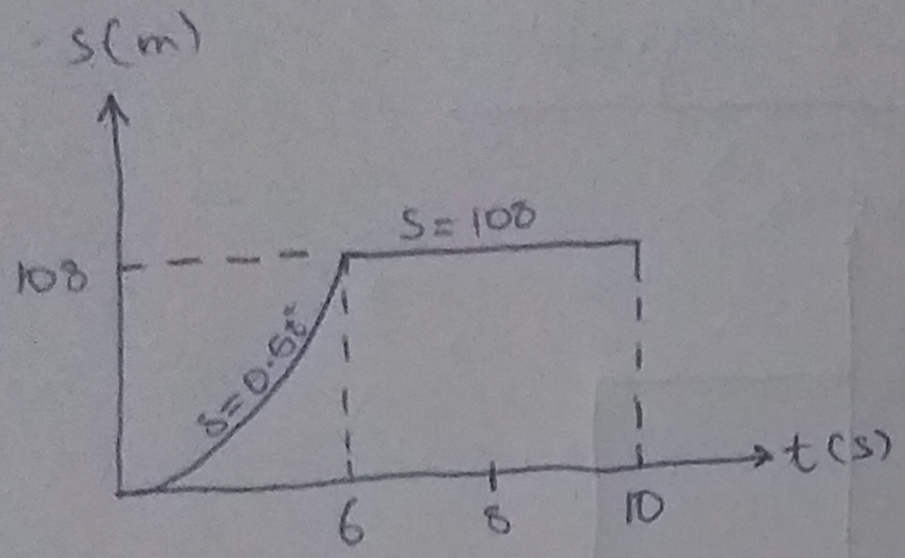
Computer Engineering

1)



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

$v = 1.5t^2$

at $t = 6s$

$v = 1.5 \times 6^2$

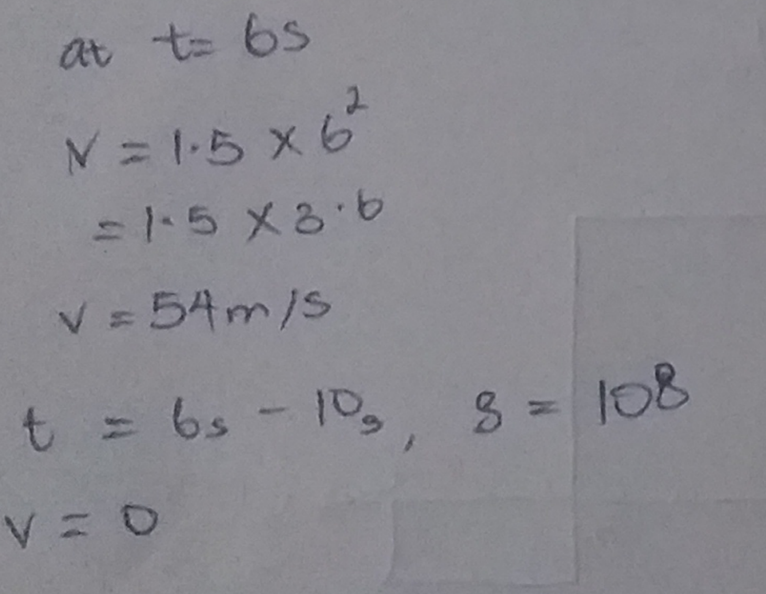
$= 1.5 \times 3.6$

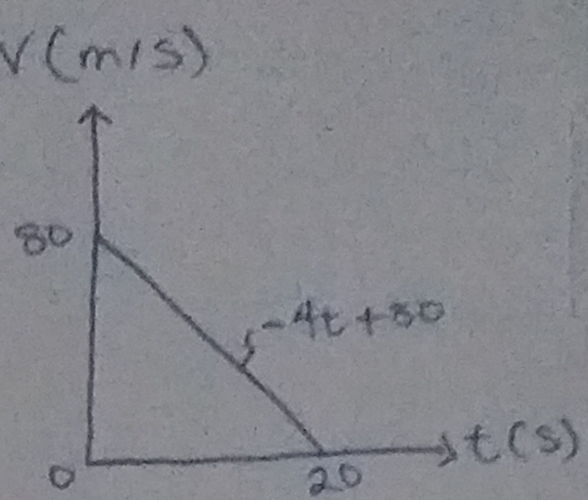
$v = 54 m/s$

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

$\therefore v = 0$

v-t graph



2) 

i) $s = \int v\,dt$

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

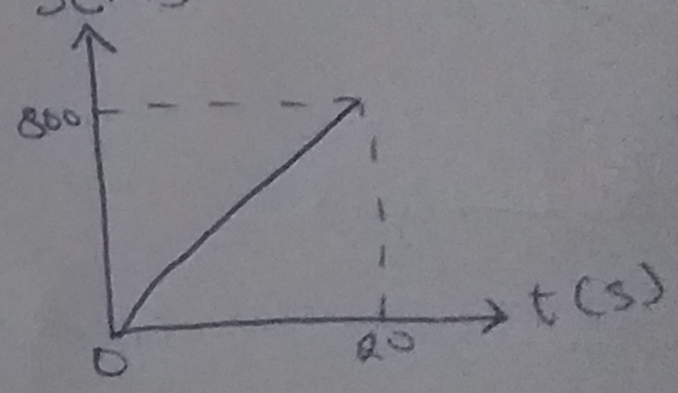
$s = -2t^2 + 80t$

at $t = 20s$

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

$s = 1600 - 800 = 800m$

s-t graph



ii) acceleration

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

$\therefore a = -4 m/s^2$

a-t graph