Name: Akoh Jesse Godwin

Mat No: 18/ENG03/013

Dept: Civil Engineering

Course: ENG 234

1) $S = 0.5t^3$

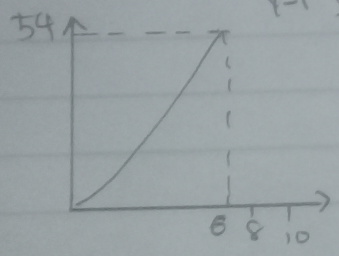
$V = \frac{ds}{dt} = 1.5t^2 m/s$

at $t = 6$

$V = 1.5 \times 6^2 = 54 m/s$

$S_2 = 10s$, $V = \frac{ds}{dt}$, $V = 0 m/s$

V-T graph



2) $S = \int v dt$ $\quad a = dv/dt$

$S = \int -4t + 80 \Rightarrow a = -4$

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

3) $V = 0.25$

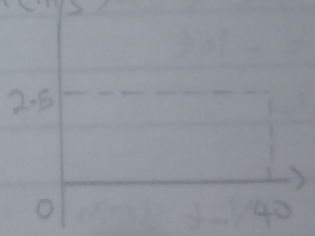
$a = \left(\frac{dv}{ds}\right) V$,

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

$a = 10 \times 0.25$

$a = 2.5 m/s^2$

(a-s graph)



4) $S = 3t^2$

$V = ds/dt$; $6t$

@ $t = 5$

2) $S = \int v\,dt$ $\quad a = dv/dt$

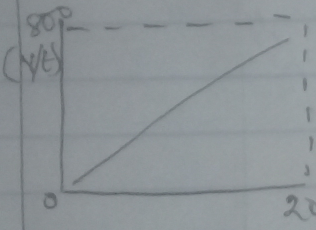
$S = \int -4t + 80 \Rightarrow a = -4$

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

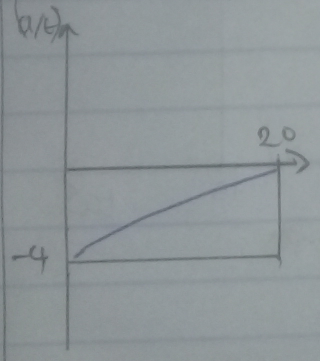
at $T = 20$ $\quad S = -2 \times 20^2 + 80 \times 20$

$S = 800m$

The S-t graph and v-t graph



S-T graph



a-T graph

4) $S = 3t^2$

$v = ds/dt = 6t$

@ $t = 5$

$v_1 = 6(5) = 30\ m/s$

$S_2 = 30t - 75$

$v = ds/dt = 30\ m/s$

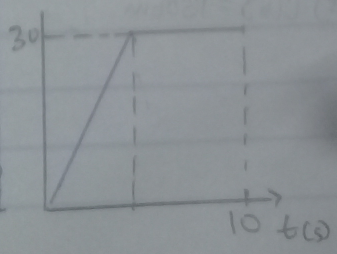
$v_2 = 30\ m/s$

$a_1 = dv/dt$; $v = 6t$ so $a_1 = 6\ m/s^2$

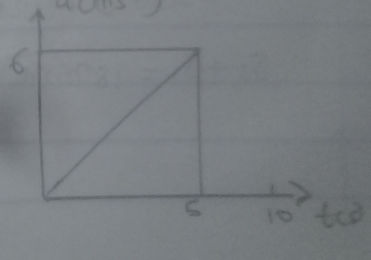
$a_2 = dv/dt$; $v = 30\ m/s^2$

so $a_2 = 0\ m/s^2$

V-T graph



a-T graph



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

$v = \int 20\,dt$

$v = 20t$ @ $t = 5$

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

$5 < t \leq t'$

$\int_{100}^{v} dv = \int_{0}^{t'} -10\,dt$

$v - 100 = -10t : (t' - 5)$

$v - 100 = -10t + 50$

$v = (-10t + 150)\ m/s$

at $v = 0$

$0 = -10t + 150$

$-150 = -10t$

$t = 15$

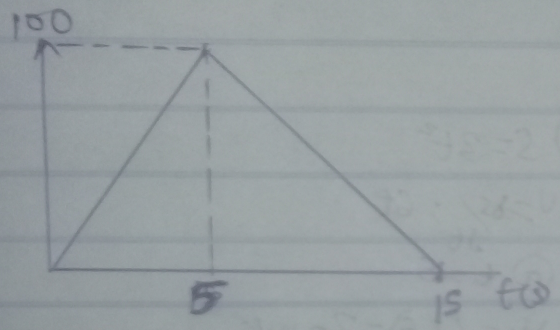
v (m/s) v-t graph

100

$-150 = -10t$

$t = 16$

v (cm/s) v–t graph



(6) $v = 30t$

$S = \int v\,dt = (15t^2)$

(a) $t = 5$

$= 15(5^2) = 375m$

$v = -15t + 225$

$S = \int v\,dt = -7.5t^2 + 225t$

at $t = t_2 - t_1 = 15 - 5 = 10$

at $t = 10$

$-7.5(10^2) + (225)(10) = 1500m$

$S_1 + S_2 = 1875m$