5.) $a = 20 m/s^2$

$a = -10 m/s^2$

$\int dv = \int a \cdot \int t$

$\int_0^v \int V = \int_0^t 20 \cdot 8t$

$V = 20t$

at $t = 5s$

$V = 100 m/s$

$\int_{100}^{v} dV = \int_5^t -10 \cdot 8t$

$V - 100 = -10(t - 5)$

$V - 100 = -10t + 50$

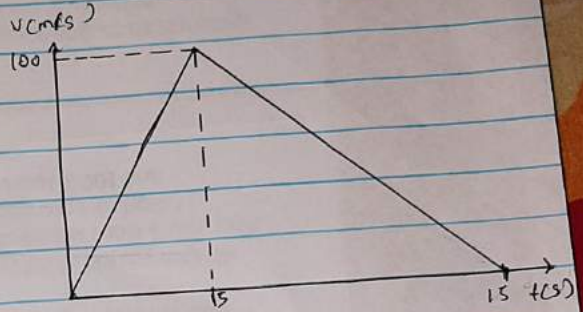
$V = (-10t + 150) m/s$

at $V = 0$

$0 = -10t + 150$

$-150 = -10t$

$t = 15s$ [For car do come to rest]



6.) $V = 30t$

$S = \int V dt = (15 + 2)$

at $t = 5$

$= 15(3)^2$

$= 375m$

$V = 15t + 225$

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

at $t = t_2 - t_1 = 15 - 5 - 70$

at $t = 10$

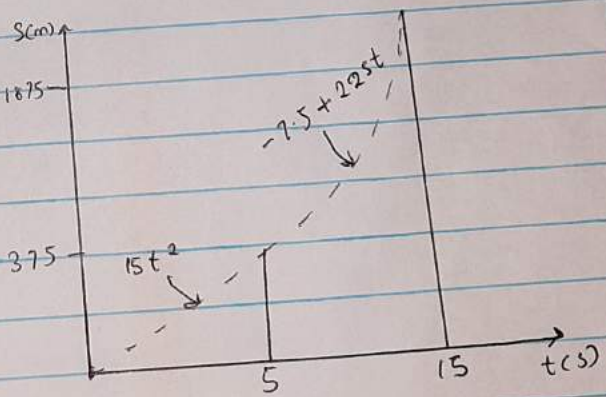
$-7.5(10)^2 + (225)40)$

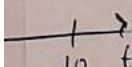
$= 1500m$

total distance travelled

$= 375 + 1500$

$= 1875m$





3.) $V = 0.25s$

$a = V(dv/ds)$

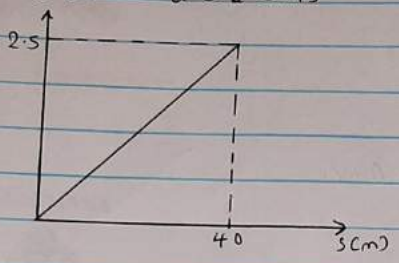
$a = 0.25s(0.25)$

$a = (0.0625s)\,m/s$

at $s = 40m$

$a = (0.0625(40))$

$a = 2.5\,m/s^2$



4.) $S = 3t^2$, $S = 30t - 75$

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

$V = \frac{ds}{dt} = 30\,m/s$ $\quad V = 30\,m/s$

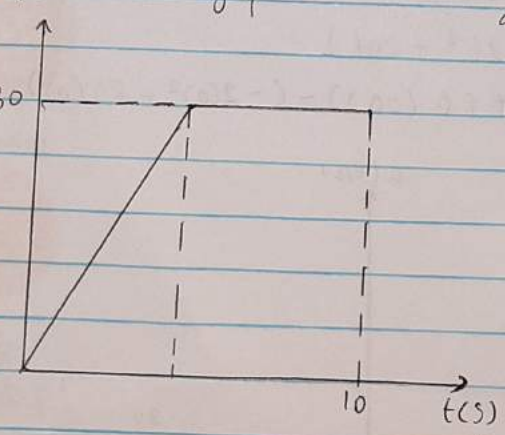
at $t = 5$

$V_1 = 6(5) = 30\,m/s$

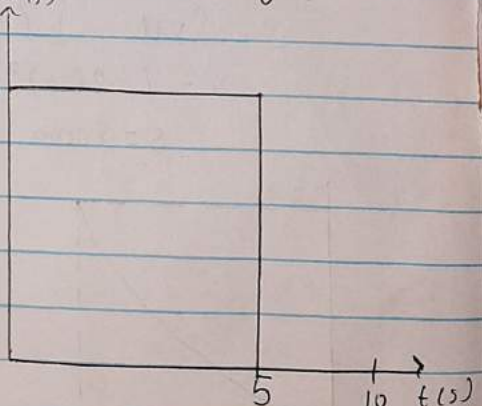
$a = \frac{dv}{dt}$ $\quad \therefore V = 6t$, $V = 30\,m/s^2$

$a = 6\,m/s^2$ $\quad a = 0\,m/s^2$

V(m/s) V-t graph



~~dt~~ a-t graph



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1.) $S = 0.5t^2 m$

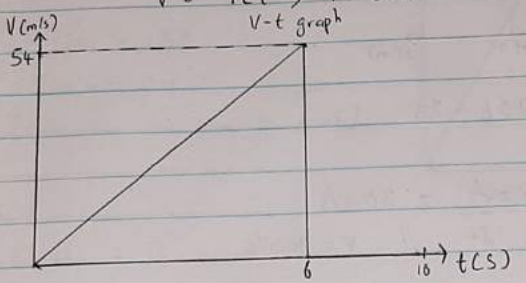
$$V = \frac{ds}{dt} = 1.5t^2 m/s$$

at $t = 6$

$V = 1.5(6)^2 = 54 m/s$

$S_2 = 108$

$V = ds/dt$, $V = 0 m/s$



2.) $V = -4t + 80$

$$a = \frac{dv}{dt} = -4 m/s^2,$$

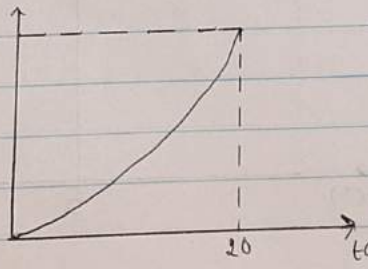
at $t = 20$

$a = 4 m/s^2$

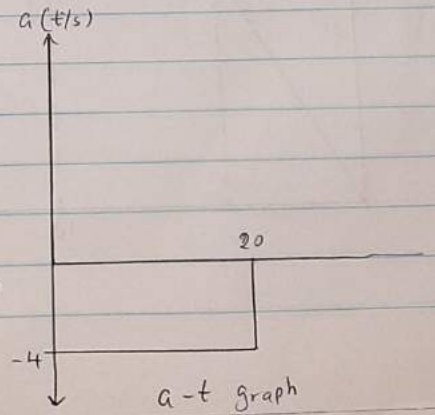
$S = \int V dt$, $\int_0^{20} (-2t^2 + 80t)$

$S = (-2(20)^2 + 80(20)) - (-2(0)^2 + 80(0))$

$S = 800m$



S-t graph



a-t graph