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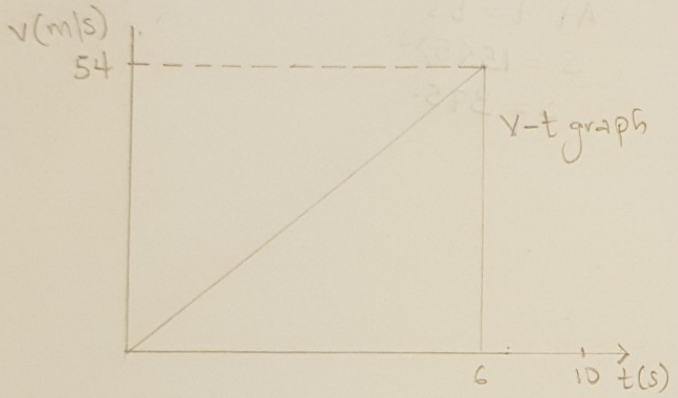
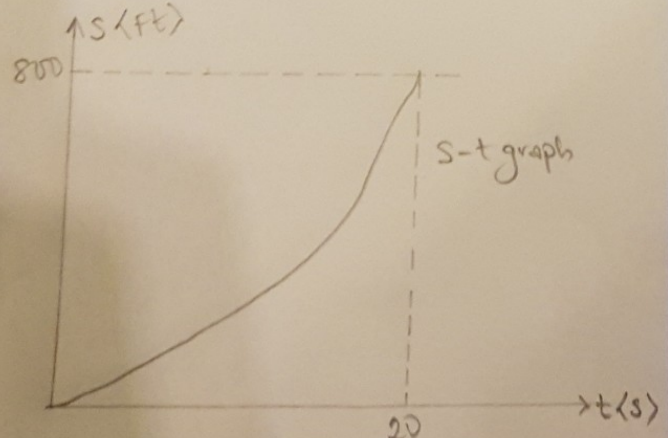
CIVIL ENGINEERING
18/ENG03/002
ENGINEERING MECHANICS (ENG 234)

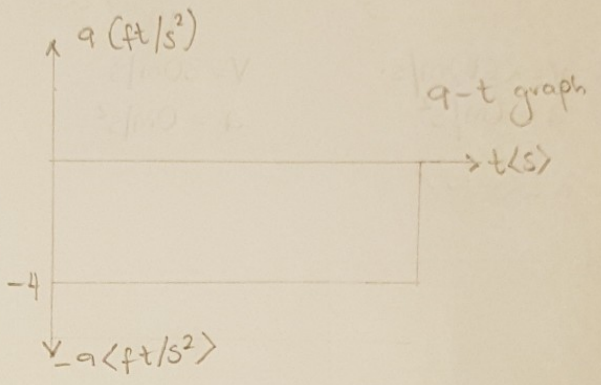
1, Given;
$S = 0.5t^3 m$
$V\frac{ds}{dt}, V_1 = 1.5t^2$
At $t = 6$
$V = 1.5(6)^2 = 54 m/s$
$S_2 = 108m$
$V = \frac{ds}{dt} = 0, v = 0m/s.$



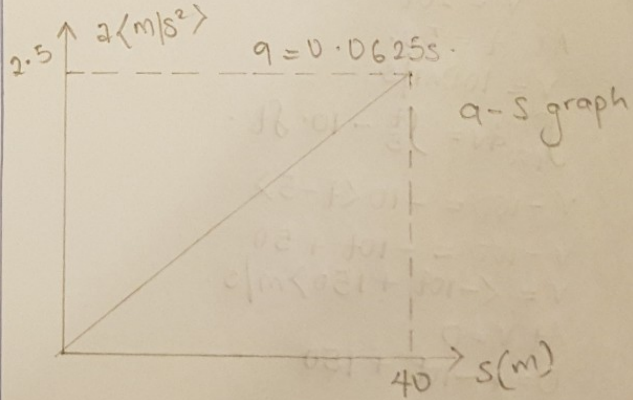
2, Given;
$V = -4t + 80$
$S = \int v dt$
$S = \int_0^{20} -4t + 80\, dt$
$S = [-2t^2 + 80t]\Big|_0^{20}$
At $t = 20$
$S = [-2(20)^2 + 80(20)]$
$S = -800 + 1600$
$S = 800ft.$



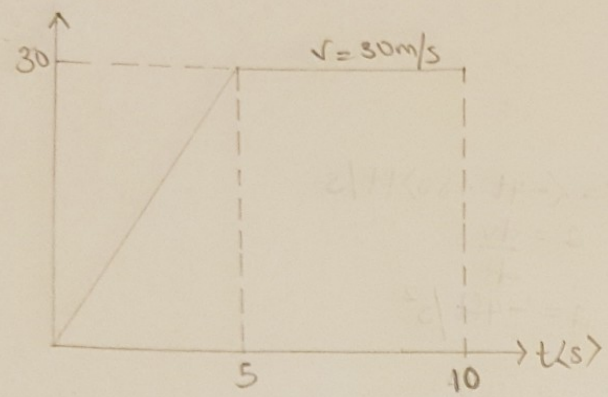
$V = \langle -4t + 80 \rangle ft/s$
$a = \frac{dv}{dt}$
$a = -4ft/s^2$



3, $V = \langle 0.25s \rangle m/s.$
$a = V\left(\frac{dv}{ds}\right)$
$a = 0.25s\langle 0.25 \rangle$
$a = \langle 0.0625s \rangle m/s^2$
At $S = 40m$
$a = \langle 0.0625 \times 40 \rangle$
$a = 2.5 m/s^2$

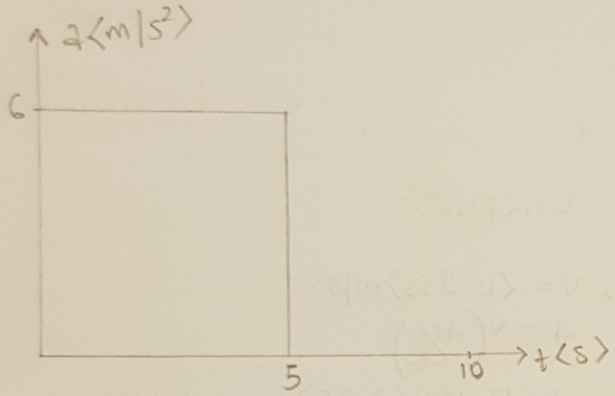


4, $S = 8t$
$V = 6t$
At $t = 5$
$V = 6 \times 5$
$V = 30 m/s$
$\Rightarrow S = 30t - 75$
$V = 30 m/s.$



$V = \langle 6t \rangle m/s$ $\quad V = 30 m/s$

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



5, $a = 20 m/s^2 \quad a = -10 m/s^2$

$\int dv = \int a \cdot dt$

$\int_0^v dv = \int_0^t 20 \cdot dt$

$v = 20t$

At $t = 5s$.

$v = 100 m/s$

$\int_{100}^{v} dv = \int_5^t -10 \cdot dt$.

$v - 100 = -10\langle t - 5 \rangle$

$v - 100 = -10t + 50$

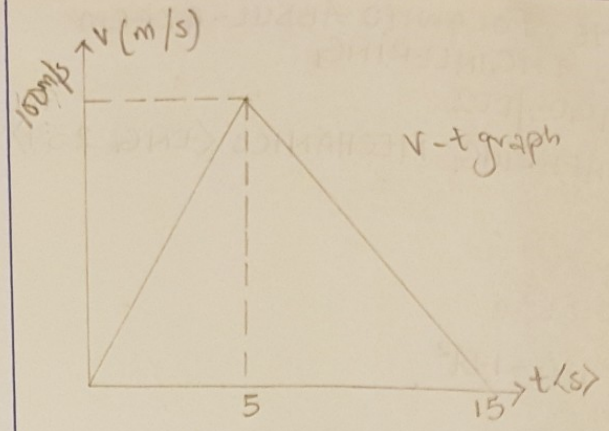
$v = \langle -10t + 150 \rangle m/s$.

At $v = 0$

$0 = -10t + 150$

$+150 = +10t$

$t = 15 sec$ <time for the car to come to rest and be in stagnant motion>. $v \langle m/s \rangle$.



6, $v = 30t$

$\int ds = \int v dt$

$\int_0^5 ds = \int_0^t \langle 30t \rangle dt$.

$5 = 15t^2$

At $t = 5s$

$S = 15\langle 5 \rangle^2$

$S = 375$.