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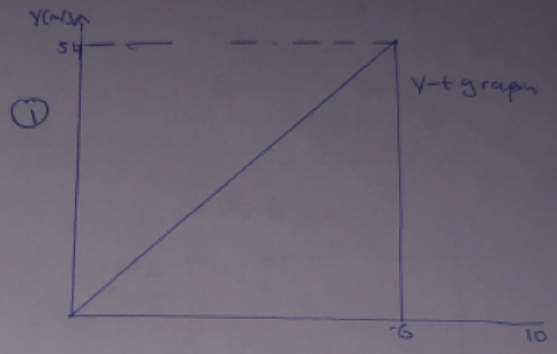
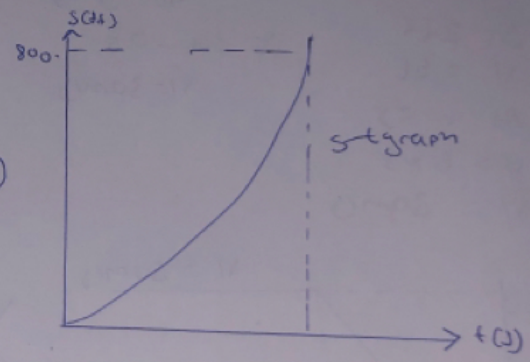
18/Eng03/031
civil Engineering

1) Given that
$S = 0.5t^3 m$
$V \frac{ds}{dt}, V_1 = 1.5t^2$
So at $t = 6$
$V = 1.5(6)^2 = 54 m/s$
$S_2 = 108m$
$V = \frac{dS}{dt} = 0$ $V = 0 m/s$

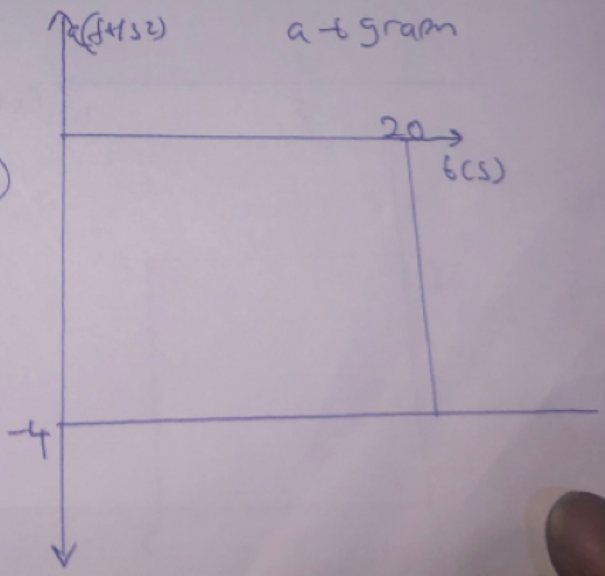


(1)

2) Given that
$V = -4t + 80$
$S = \int V dt$
$S = \int_0^{20} [-4t + 80] dt$
$S = [-2t^2 + 80] \Big|_0^{20}$
$\therefore$ at $t = 20$
$S = [-2(20)^2 + 80(20)]$
$S = -800 + 1600$
$S = 800 ft$



(2i)



(2ii)

3) $V = (0.25s)\,m/s$

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

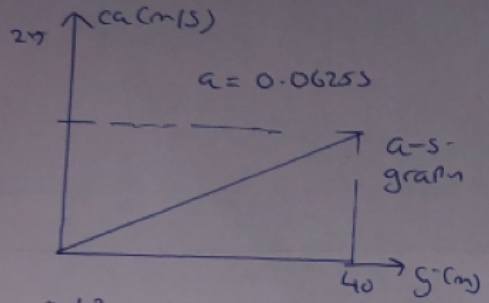
$a = 0.25s\,(0.25)$

$a = (0.0625s)\,m/s^2$

At $s = 40m$

$a = (0.0625 \times 40)$

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



4) $s = 3t^2$

$V = 6t$

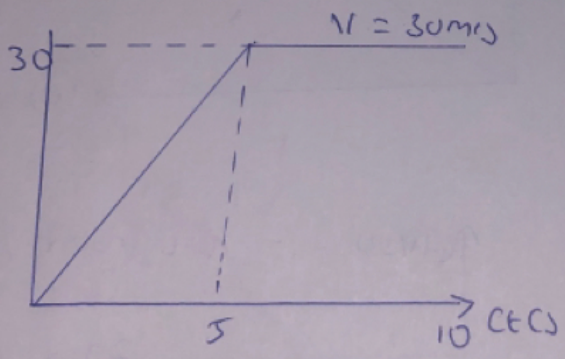
At $t = 5$

$V = 6 \times 5$

$V = 30m/s$

$s = 30t - 75$

$V = 30m/s$

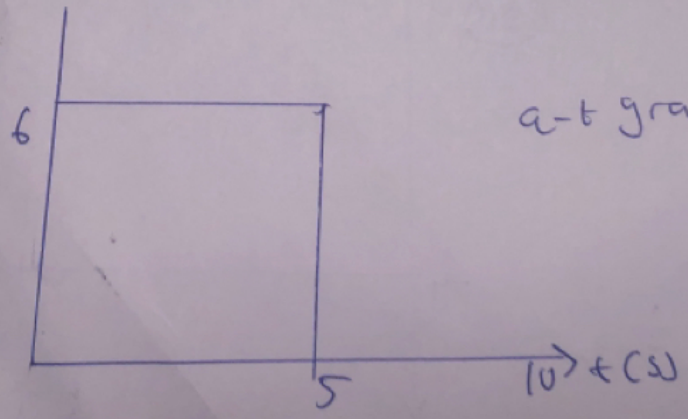


$V = (6t)\,m/s$ $\quad V = 30m/s$

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

$a(m/s)^2$

a-t graph



a-t graph