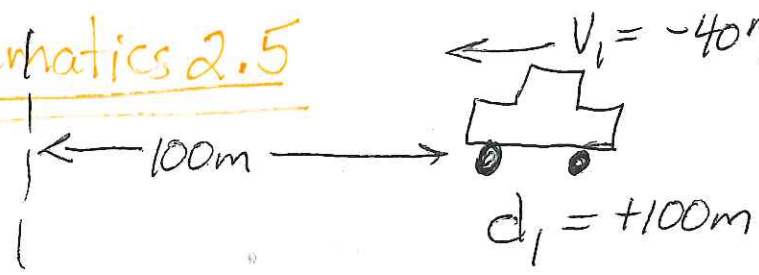
Kinematics 2.5

(1)



Kinematics 2.5

a) $V_2 = V_1 + a(\Delta t)$

$\boxed{V_2 = -40 + 6(\Delta t)}$

b) $V_2 = -40 + 6(1) = -34\ m/s$

$V_2 = -40 + 6(2) = -28\ m/s$

$V_2 = -40 + 6(10) = +20\ m/s$

$V_2 = -40 + 6(12.6) = +35.6\ m/s$

c) $d_2 = d_1 + V_1(\Delta t) + \frac{1}{2}a(\Delta t)^2$

$d_2 = 100 + -40(\Delta t) + \frac{1}{2}(6)(\Delta t)^2$

$\boxed{d_2 = 100 + -40(\Delta t) + 3(\Delta t)^2}$

d) $d_2 = +7m \Rightarrow$ 7m right of the post @ $t = 3s$

$d_2 = -32m \Rightarrow$ 32m left " " " @ $t = 6s$

$d_2 = +128m \Rightarrow$ 128m right " " " @ $t = 14s$

$d_2 = +500m \Rightarrow$ 500m right " " " @ $t = 20s$

e) $d_2 = d_1 + V_1(\Delta t) + \frac{1}{2}a(\Delta t)^2$

$+30 = +100 + -40(\Delta t) + \frac{1}{2}(6)(\Delta t)^2$

$0 = 70 + -40(\Delta t) + 3(\Delta t)^2 \Rightarrow$

$\Delta t = 11.3s$

$\Delta t = 2.1s$

(2) Solution

A) $V_2 = V_1 + a(\Delta t)$

$\boxed{V_2 = 20 + 4(\Delta t)}$

B) $V_2 = 20 + 4(1) = 24\ m/s$

$V_2 = 20 + 4(2) = 28\ m/s$

$V_2 = 20 + 4(3) = 32\ m/s$

$V_2 = 20 + 4(10) = 60\ m/s$

$V_2 = 20 + 4(14.8) = 79.2\ m/s$

C) $d_2 = d_1 + V_1(\Delta t) + \frac{1}{2}a(\Delta t)^2$

$d_2 = -200 + 20(\Delta t) + \frac{1}{2}(4)(\Delta t)^2$

$\boxed{d_2 = -200 + 20(\Delta t) + 2(\Delta t)^2}$

D)

$d_2 = -152\ m \Rightarrow$ 152m left of post @ $t = 2s$

$d_2 = -88\ m \Rightarrow$ 88m " " " " $t = 4s$

$d_2 = +200\ m \Rightarrow$ 200m right " " " $t = 10s$

$d_2 = +534\ m \Rightarrow$ 534m right " " " $t = 14.8s$

E) $d_2 = d_1 + V_1(\Delta t) + \frac{1}{2}a(\Delta t)^2$

$-80 = -200 + 20(\Delta t) + \frac{1}{2}(4)(\Delta t)^2$

~~$120 = 20(\Delta t) +$~~ $0 = -120 + 20(\Delta t) + 2(\Delta t)^2$

$\boxed{\Delta t = 4.2s}$ or $\Delta t = -14.2s$