Pg 53 **Velocity + Displacement with Constant Acceleration** Set D

Velocity w/ constant Acc. $V_f = V_i + a \cdot \Delta t$

Displacement w/ constant Acc $\Delta x = V_i \cdot \Delta t + \left(\frac{1}{2} a\right)(\Delta t^2)$

#1 ① $a = 0.92 m/s^2$, $V_f = \_\_\_ m/s$, $V_i = 6.5 m/s$, $\Delta t = 3.6 s$, $\Delta x = \_\_\_ m$

② Select formula. Which do you want to solve for first?

V_f? Okay. Lets go.

$V_f = V_i + a \cdot \Delta t$

③ $V_f = V_i + a \cdot \Delta t$

$V_f = 6.5 m/s + 0.92 \frac{m}{s^2} \cdot 3.6 s$

$V_f = 6.5 \frac{m}{s} + 3.31 \frac{m}{s}$

$\boxed{V_f = 9.8 \frac{m}{s}}$

② Now solve for Δx

$\Delta x = V_i \cdot \Delta t + \left(\frac{1}{2} a\right) \cdot (\Delta t^2)$ (square 3.6)

$\Delta x = 6.5 \frac{m}{s} \cdot 3.6 s + \left(\frac{1}{2} \cdot 0.92 m/s^2\right) \cdot (3.6 s^2)$

$\Delta x = 23.4 m + (0.46 \frac{m}{s^2}) \cdot (12.96 s^2)$

$\Delta x = 23.4 m + 5.96 m$

$\boxed{\Delta x = 29.36 m}$

#2 ① ~~V_i~~, $a = 3.0 m/s^2$, $V_f = \_\_\_ m/s$, $V_i = 4.3 m/s$, $\Delta t = 5.0 s$, $\Delta x = \_\_\_ m$

② Lets solve for V_f first.

$V_f = V_i + a \cdot \Delta t$

Solve for Δx

$\Delta x = V_i \cdot \Delta t + \left(\frac{1}{2} a\right) \cdot (\Delta t^2)$

③ $V_f = 4.3 m/s + (3.0 m/s^2) \cdot (5.0 s)$

$V_f = 4.3 m/s + 15 m/s$

$\boxed{V_f = 19.3 m/s}$

$\Delta x = 4.3 m/s \cdot 5 sec + \left(\frac{1}{2} 3.0 m/s^2\right) \cdot (5.0 s^2)$

$\Delta x = 21.5 m + (1.5 m/s^2) \cdot (25 s^2)$

$\Delta x = 21.5 m + 37.5 m$

$\boxed{\Delta x = 59 m}$

#3 pg 53 cont.

① $a = -1.5\frac{m}{s^2}$

$V_f = \_\_ m/s$

$V_i = 0 m/s$

$\Delta t = 5.0 s$

$\Delta x = \_\_ m$

②

$V_f = V_i + a \cdot \Delta t$

③

$V_f = 0 m/s + (-1.5\frac{m}{s^2}) + (5.0 s)$

$V_f = 0\frac{m}{s} + (-7.5\frac{m}{s})$

$[V_f = -7.5 m/s]$

$\Delta x = V_i \cdot \Delta t + (\frac{1}{2} a) \cdot (\Delta t^2)$

$\Delta x = (0\frac{m}{s})(5 s) + \frac{1}{2}(-1.5\frac{m}{s^2}) \cdot (5.0 s)^2$

$\Delta x = 0 + (-.75 m/s^2) \cdot (25 s^2)$

$[\Delta x = -18.75 m]$

#4 ① $a = -2\frac{m}{s^2}$

$V_f = 10\frac{m}{s}$

$V_i = 15\frac{m}{s}$

$\Delta t =$

$\Delta x =$

②

$V_f = V_i + a \cdot \Delta t$

③

V_f

~~$10 m/s = 10$~~

$10 m/s = 15 m/s + (-2 m/s^2) \cdot (\Delta t)$

$10\frac{m}{s} - 15\frac{m}{s} = -2 m/s^2 \cdot \Delta t$

$-5\frac{m}{s} = -2\frac{m}{s^2} \cdot \Delta t$

$[2.5 s = \Delta t]$

$\Delta x = V_i \cdot \Delta t + (\frac{1}{2} a) \cdot (\Delta t)^2$

$\Delta x = 15\frac{m}{s} \cdot 2.5 s + \frac{1}{2}(-2\frac{m}{s^2}) \cdot (2.5 s)^2$

$\Delta x = 37.5 m + (-1\frac{m}{s^2}) \cdot (6.25 s^2)$

$\Delta x = 37.5 m + -6.25 m$

$[\Delta x = 31.3 m]$