Version A

# Quiz 1 Solutions

(1) $\frac{55\ mi}{hr} \left|\frac{1\ hr}{3600\ s}\right| \frac{1609\ m}{1\ mi} = 25\ m/s$

(2) $v = at^2 + bt^3$

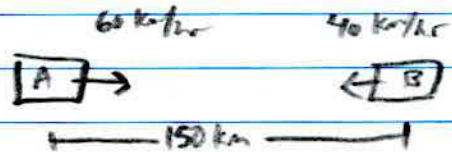
$\left[\frac{m}{s}\right] = [a]\left[s^2\right] + [b]\left[s^3\right]$ so $[a] = \left[\frac{m}{s^3}\right]$, $[b] = \left[\frac{m}{s^4}\right]$

(3) $\Delta x = x_f - x_i$

A) $\Delta x = 6 - 4 = 2\ m$
B) $\Delta x = -8 - 4 = -4\ m$
C) $\Delta x = 2 - -4 = 6\ m$
D) $\Delta x = -2 - 4 = -6\ m$
E) $\Delta x = 4 - -4 = 8\ m$ → E

(4) $v_{Avg} = \frac{\Delta x}{\Delta t} = \frac{7(2) - 3(2)^2}{2} = 1\ m/s$

(5)




$\Delta x_A = v_{0A} t$

$\Delta x_B = v_{0B} t$

$\Delta x_A + \Delta x_B = 150\ Km$

so $150 = (60 + 40)t \rightarrow t = 1.5\ hr$

(6) $v_{Avg} = \frac{\Delta x}{\Delta t} = \frac{0 - 12}{4} = -3\ m/s$

(7) $v_f = v_0 + \int a\,dt \rightarrow$ stops @ $v_f = 0$

so $0 = 16 + \left(-0.5\frac{t^2}{2}\right) \rightarrow t = 8\ s$

(8)


it takes 1 second to reach top so

$v_f = v_0 + at \rightarrow 0 = v_0 - g(1) \rightarrow v_0 = g$

$v_f^2 = v_0^2 + 2ah \rightarrow 0 = g^2 - 2gh \rightarrow h = g/2$