CP - Sept 13

The Big Five

$$a = \frac{V_f - V_0}{\Delta t}$$

$$\frac{100\frac{mi}{hr} - 20\frac{mi}{hr}}{8\,sec} = \frac{80\frac{mi}{hr}}{8\,sec}$$

$$10\ \frac{mi}{hr\ s}$$

$$a = \frac{V_f - V_0}{\Delta t}$$

$$a\Delta t = V_f - V_0$$

$$V_0 + at = V_f$$

$$V_f = V_0 + at$$

If you are going $2\frac{m}{s}$ and then acc at $3\frac{m}{s^2}$ for 5 sec what is your V_f?

$$V_f = 2\frac{m}{s} + \left(3\frac{m}{s^2}\right)(5\,s)$$

$$5 \cdot 5$$

$$= 2\frac{m}{s} + 15\frac{m}{s}$$

$$V_f = 17\frac{m}{s}$$

You are driving at $20\frac{m}{s}$ and then acc at $3\frac{m}{s^2}$ for 8sec

What is your V_f?

$$V_f = V_0 + at$$

$$= 20\frac{m}{s} + \left(3\frac{m}{s^2}\right)(8\,s)$$

$$= 20\frac{m}{s} + 24\frac{m}{s}$$

$$44\frac{m}{s}$$

#3

$$d = \left(\frac{V_0 + V_f}{2}\right)t$$

$$d = V_0 t + \frac{1}{2} a t^2$$

The Big Kahuna

d	distance	m
V_0	initial velocity	$\frac{m}{s}$
t	time	s
a	acceleration	$\frac{m}{s^2}$

You are sitting at a light, it changes and you acc at $\frac{5m}{s^2}$ for 4s. How far did you go?

① write the equation

$$d = \cancel{V_0 t} + \frac{1}{2} a t^2$$

$$+ \frac{1}{2}\left(\frac{5m}{s^2}\right)(4s)^2$$

$$\frac{1}{2}\left(\frac{5m}{\cancel{s^2}}\right)\left(\frac{16\cancel{s^2}}{1}\right)$$

$$\frac{1}{2}\ (80m)$$

$$d = 0 + 40m$$

$$\boxed{d = 40m}$$

You drive at $5\frac{m}{s}$ and then acc at $8\frac{m}{s^2}$ for 3sec. How far did you travel in this 3 sec?

$$d = V_0 t + \frac{1}{2} a t^2$$

$$= \frac{5m}{\cancel{s}}\frac{(3\cancel{s})}{1} + \frac{1}{2}\frac{8m}{s^2}(3s)^2$$

$$= 15m + \frac{4m}{\cancel{s^2}}(9\cancel{s^2})$$

$$= 15m + 36m$$

$$\boxed{51m}$$

$$\boxed{V_f^2 = V_0^2 + 2ad}$$

$$V_0 = 5\frac{m}{s}$$

$$a = 2\frac{m}{s^2}$$

$$d = 100m$$

$$V_f = ?$$

$$V_f^2 = V_0^2 + 2ad$$

$$= \left(\frac{5m}{s}\right)^2 + 2\left(\frac{2m}{s^2}\right)\frac{100m}{1}$$

$$= \frac{25m^2}{s^2} + \frac{400m^2}{s^2}$$

$$V_f^2 = \frac{425m^2}{s^2}$$

$$\boxed{\frac{20.62m}{s}}$$