CP - Sept 12

$s = \frac{d}{t}$ $\quad s_{avg} = \frac{\text{total distance}}{\text{total time}}$

example: a squirrel runs 30m in Deep weeds for 15 sec. then gets to short grass and runs 40m in 10 sec.
what is avg speed?

$s_{avg} = \frac{\text{total dist}}{\text{total time}} = \frac{d_1 + d_2}{t_1 + t_2}$

$\frac{30m + 40m}{15s + 10s} = \frac{70m}{25s} =$ **2.8 $\frac{m}{s}$**

not m/s

start at 1:00 End at 106

117 mi. 110 mi.

Velocity = $\frac{\text{the change in distance}}{\text{the change in time}}$

$V_{avg} = \frac{\Delta d}{\Delta t}$

Δ Delta means: the change in...

$V_{avg} = \frac{d_{final} - d_{initial}}{\Delta \text{ time}} = \frac{117 - 110 \text{ mi}}{6 \text{ min}} = \frac{7 \text{ mi}}{6 \text{ min}}$

$\frac{7 \text{ mi}}{6 \text{ min}} =$ **1.16 $\frac{\text{mi.}}{\text{min}}$**

$$V\Delta t = \left(\frac{d_f - d_i}{\Delta t}\right)\Delta t$$

$$d_i + V\Delta t = d_f - d_i + d_i$$

$$d_i + V\Delta t = d_f$$

$$d = d_i + Vt$$

Example If you start at marker d_i 200 mi and drive 30 mi/hr for 2 hr, where will you be? (t)

$$d_{final} = d_i + Vt$$

$$= 200\text{ mi} + \left(\frac{30\text{ mi}}{\text{hr}}\right)\left(\frac{2\text{ hr}}{1}\right)$$

$$= 200\text{ mi} + 60\text{ mi}$$

$$= \boxed{260\text{ mi}}$$

Acceleration = $\frac{\text{change in speed}}{\text{change in time}}$

$$\boxed{a = \frac{V_f - V_i}{\Delta t}}$$

(V_f: final velocity; V_i: initial velocity)

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

Example sitting at the light, then I accelerate to 60 mi/hr (not ~~60 mph~~) in 8 sec. What is the acc?

$$a = \frac{V_f - V_i}{\Delta t} \qquad \frac{60\left(\frac{\text{mi}}{\text{hr}}\right) - 0}{8\text{ sec}} =$$

$$7.5\ \frac{\frac{\text{mi}}{\text{hr}}}{\text{sec}}$$

$$\boxed{7.5\ \frac{\text{mi}}{\text{hr}\cdot\text{sec}}}$$

Was driving $55 \frac{mi}{hr}$

slowed to $35 \frac{mi}{hr}$

did this in 3 sec.

What is my acc?

V_f $35 \frac{mi}{hr}$

V_i $55 \frac{mi}{hr}$

t 3 sec

a

$$a = \frac{V_f - V_i}{\Delta t} = \frac{35 - 55 \frac{mi}{hr}}{3 \text{ sec}}$$

$$= \frac{-20 \frac{mi}{hr}}{3 \text{ sec}} = -6.67 \frac{mi}{hr \text{ sec}}$$