Do Now

- Take out your notebook, calculator and a pencil and solve the following in your notes using a Vf = Vi + at and a V-t graph.
- A car is traveling at 17m/s. It accelerates at 2.5m/s^2 for 5 seconds. How far does the car travel during that time?

Today

- 2nd and 3rd kinematics equations.
- Review of Friday's Quiz.

Tonight

- Get onto Quest
- Look at 1-D kinematics problems.
- You should be able to do problems 1-9 tonight.

- A car is traveling at 17m/s. It accelerates at 2.5m/s^2 for 5 seconds. How far does the car travel during that time?

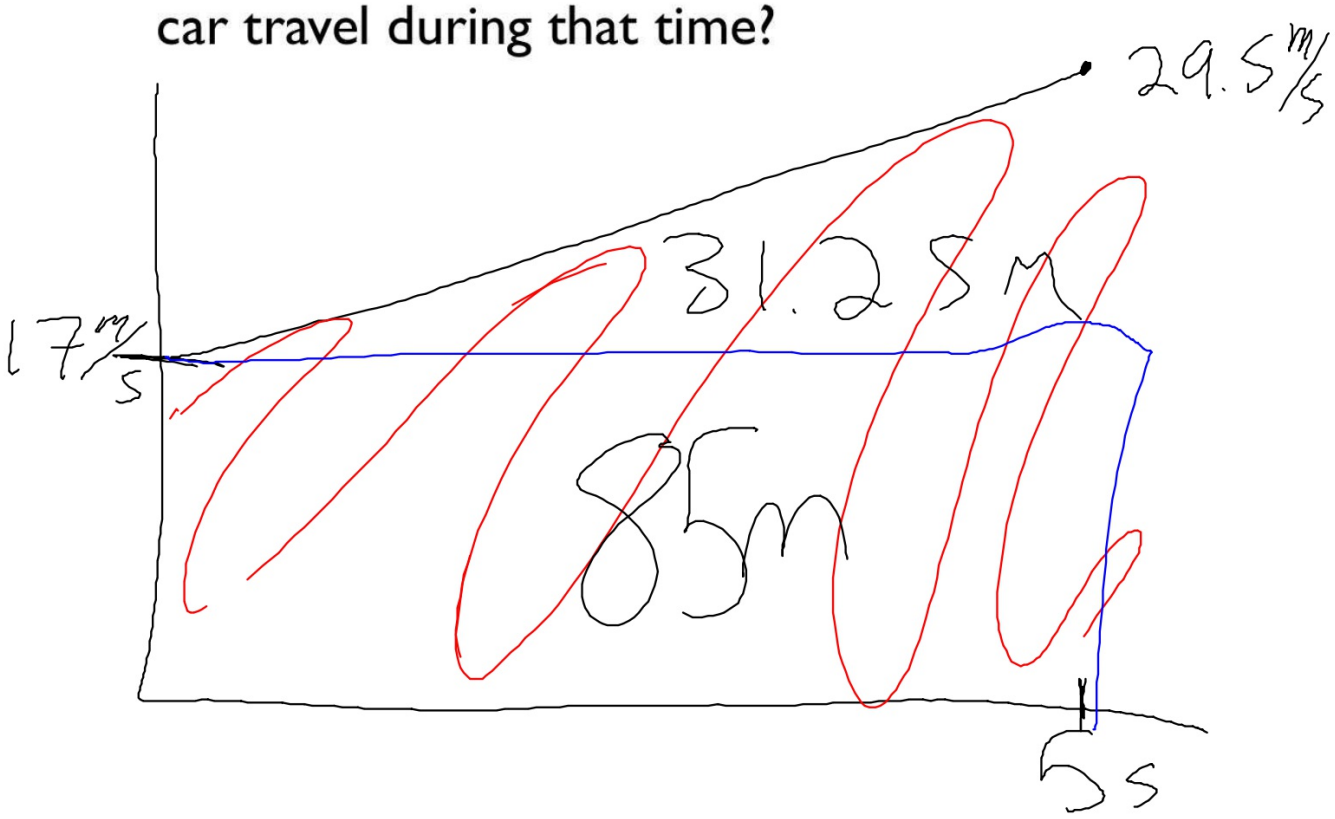
K: $v_i = 17\ m/s$, $a = 2.5\ m/s^2$, $t = 5\ s$

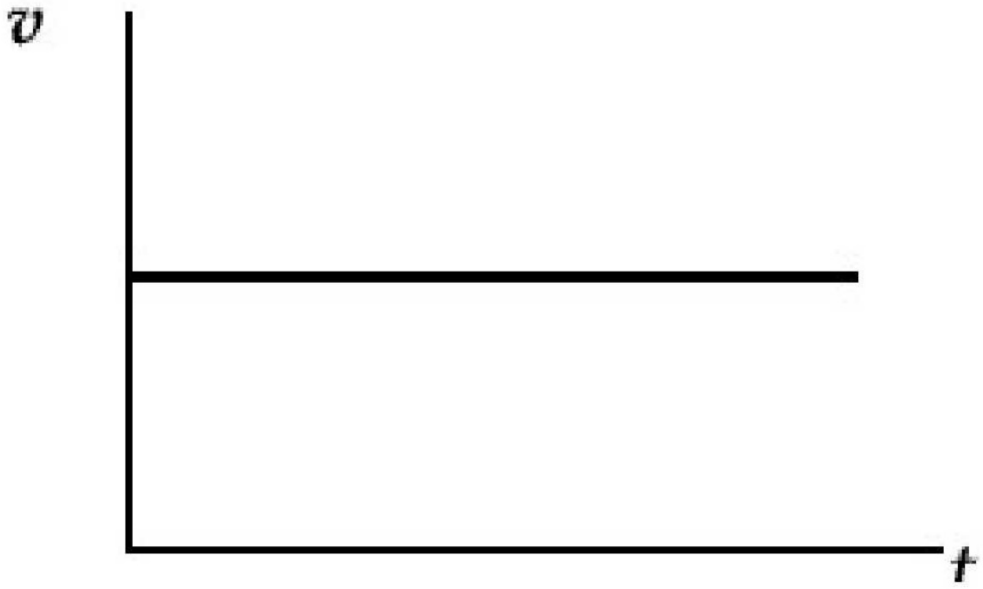
U: $v_f = 29.5\ m/s$

Eqn: $v_f = v_i + at$

$v_f = 17\ m/s + 2.5\ m/s^2 \cdot 5\ s$

- A car is traveling at 17m/s. It accelerates at 2.5m/s^2 for 5 seconds. How far does the car travel during that time?

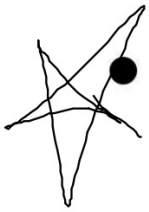




Velocity-time Graph

For Each Problem

- 1) Draw a picture
- 2) write your knowns
- 3) write your unknowns
- 4) write the relevant equation
- 5) isolate the unknown variable algebraically, and only then
- 6) plug in numbers.



- $\Delta x = V_i t + (1/2)at^2$

  - The second kinematics equation.
  - Δx: displacement
  - Vi: initial velocity
  - a: acceleration t: time

LeSean McCoy is running at 4m/s when he catches a pass. He then accelerates at 1.2m/s^2 for 5 seconds and then scores a touchdown. How far did he run with the ball? Answer in meters.

K: $V_i = 4\ m/s$, $a\ 1.2\ m/s^2$, $t = 5\ s$

U: $\Delta x = ?$

E: $\Delta x = V_i t + \frac{1}{2} a t^2$

$\Delta x = 4\frac{m}{s}\,5\,s + (0.5)\,1.2\frac{m}{s^2}\,(5\,s)^2$

$\Delta x = 35\ m$

A dog gets away from its owner. It runs 35m in 14 seconds. Assuming that it was sitting when it started running, what was the dog's acceleration?

K: $\Delta x = 35m$, $t = 14s$, $V_i = 0 m/s$

U: $a =$

Eqn: $\Delta x = V_i t + \frac{1}{2} a t^2$ ($V_i \to 0$)

$$\frac{\Delta x}{t^2} = \frac{\frac{1}{2} a t^2}{t^2} \Rightarrow \frac{2\Delta x}{t^2} = \frac{1}{2} a 2$$

$$\Rightarrow a = \frac{2\Delta x}{t^2} = \frac{2 \cdot 35m}{(14s)^2} = .036 \frac{m}{s^2}$$

Quiz 1

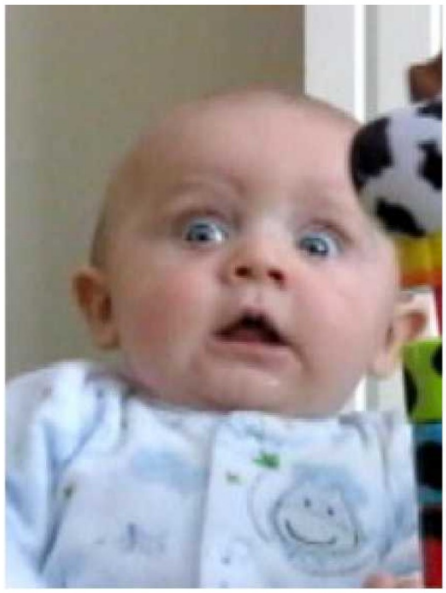
- The quiz is out of 72.
- The average was an 86%.
- Check IC to see that the grade on the page is the grade on the quiz.
- I will take questions in a moment.

$$V_f^2 = V_i^2 + 2a\Delta x$$

- The final kinematic equation.
- You do not need time for this formula.
- Units are the same as the other kinematic equations.

Too Many Formulas!

- Don't panic!
- You can only use a formula if you have **only** one unknown.
- If you have more than one unknown, you can't use it.



A speed boat is going 15m/s. It accelerates uniformly at 3m/s^2 over the span of 80m. What is the boat's final velocity?

K: $V_i = 15\ m/s,\ a = 3\ m/s^2,\ \Delta x = 80\ m$

U: $V_f = ?$

Eqn: $V_f^2 = V_i^2 + 2a\Delta x$

$$V_f = \sqrt{V_i^2 + 2a\Delta x} = 26.55\ \frac{m}{s}$$

One direction is walking down the street at 0.8m/s after a long concert. A flock of screaming fans sees them and starts chasing them. The boys escape by accelerating to 4.5m/s while running for a taxi 20m away, how long does it take them to get there?

Quest Assessment

- Go to my school wires page.
- Click in quest homework under important links.
- Register for a student EID.
- Request enrollment in this class.
  - Search 6411168

You have the rest of the period to work on probems.