

We'll start in a few minutes, lets just wait til everyone is here

Intro to Vernier Assignment is Graded
Grades are on canvas and gradescope
You can also view the rubric items on gradescope

Make sure you have the PRE Lab done BEFORE Lab

Speed and Velocity

Average speed = distance traveled/elapsed time

$$\bar{s} = \frac{d}{\Delta t}$$

SI Units: meters/second (m/s)

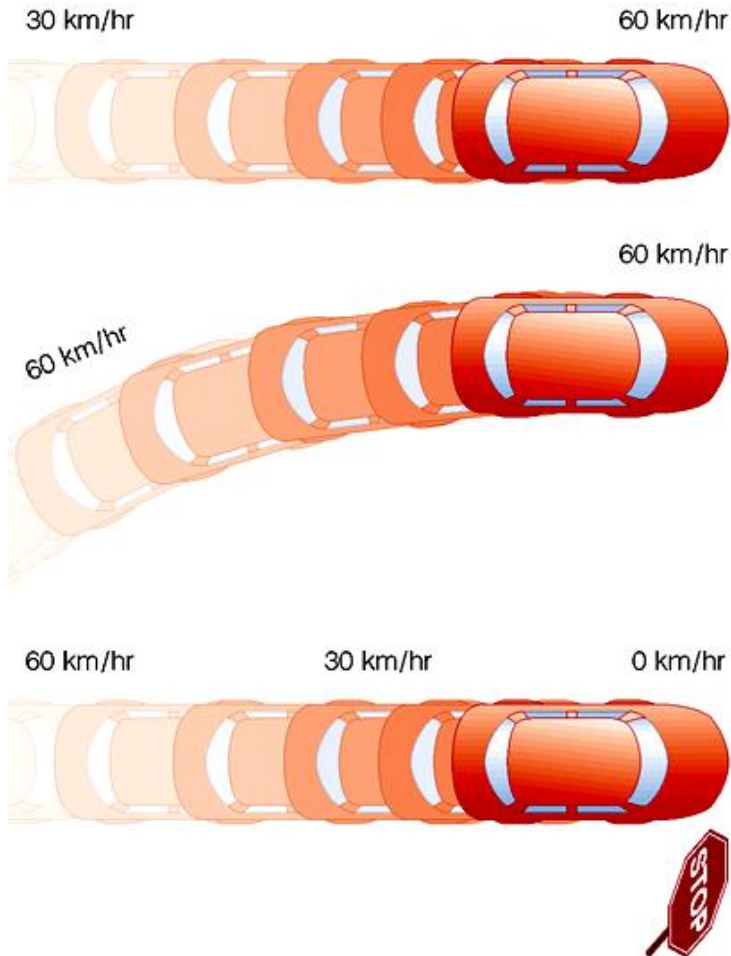
velocity = displacement/elapsed time

$$\vec{v} = \frac{dx}{dt} = \frac{x_f - x_i}{t_f - t_i}$$

SI Units: meters/second (m/s)



Acceleration



acceleration:

change of velocity

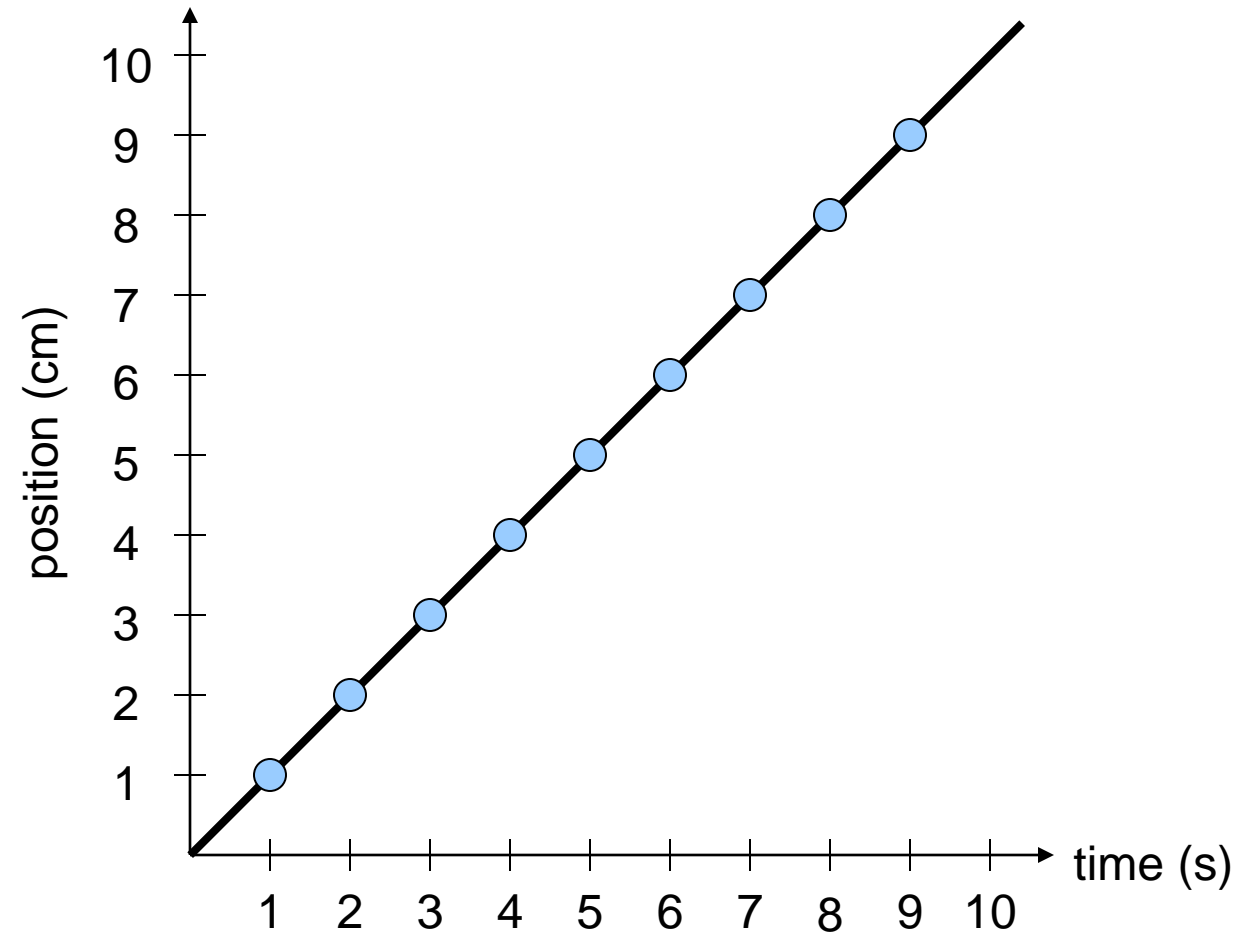
change of speed **and/or** direction

$$a = \frac{dv}{dt}$$

SI units: m/s²

Position Time Plots

What does this plot tell us about velocity?

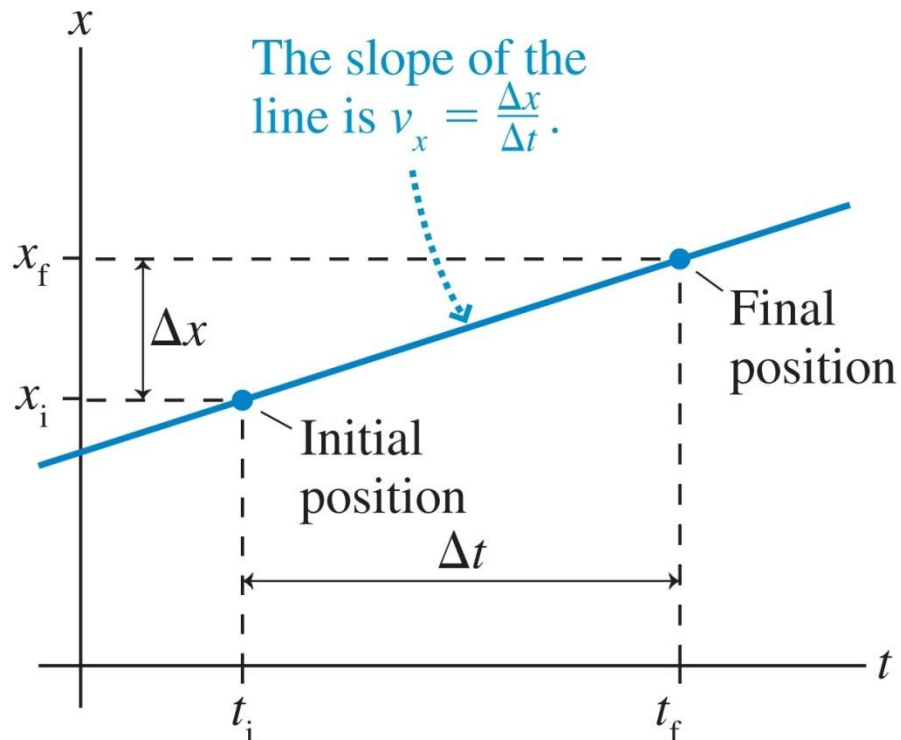


Slope and Position-Time Graphs

velocity = slope of the line
connecting final and initial positions

$$\text{Slope} = m$$

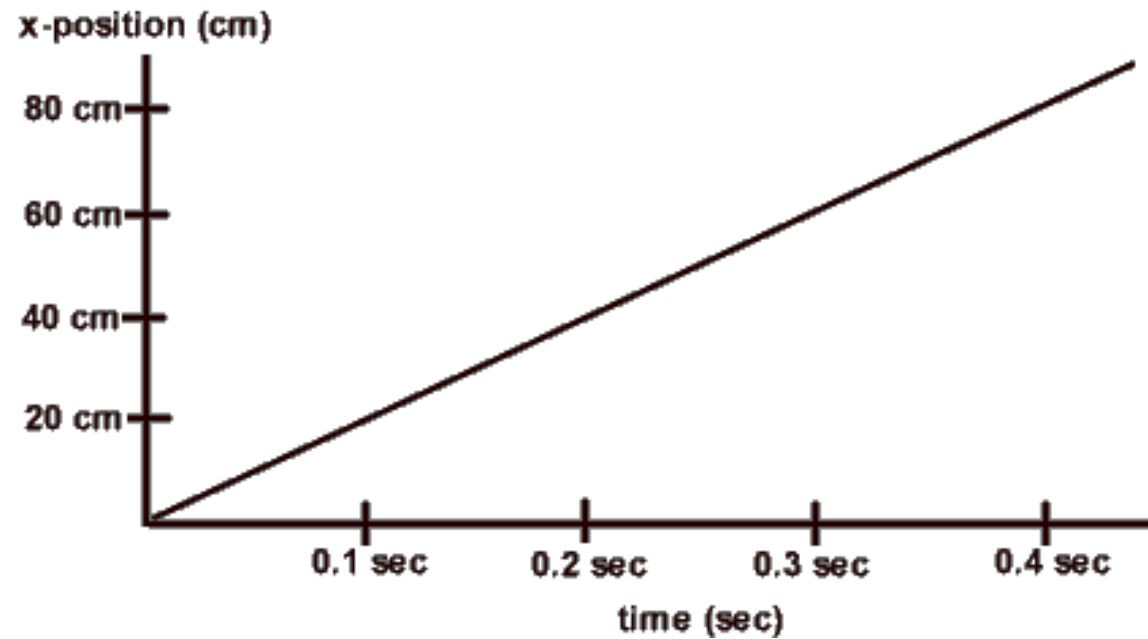
$$v = dx/dt$$



Dimensional Analysis
rise units: m
run units: s
Units of slope: m/s

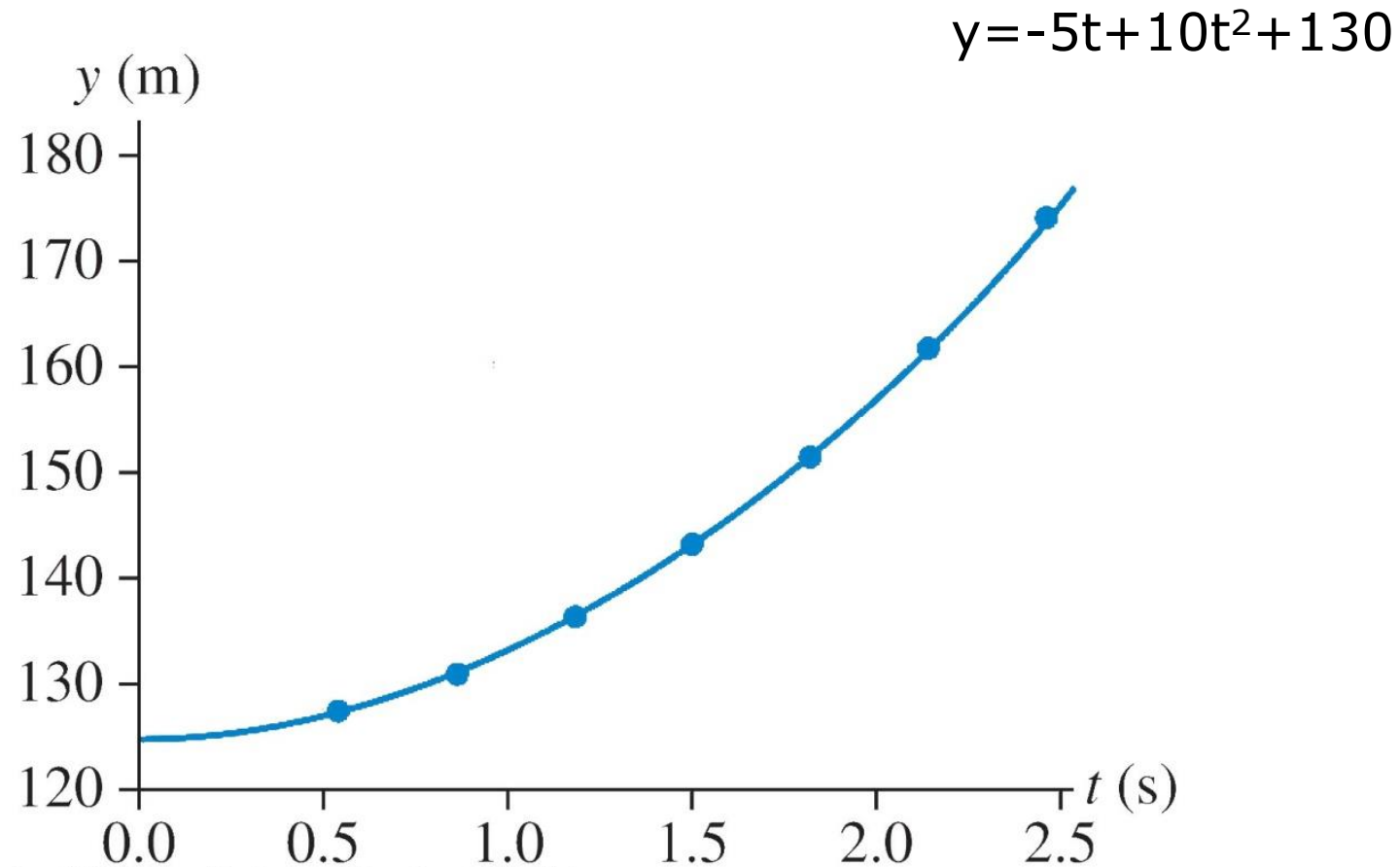
Position Time Plots

What does this plot tell us about acceleration?



Position Time Plots

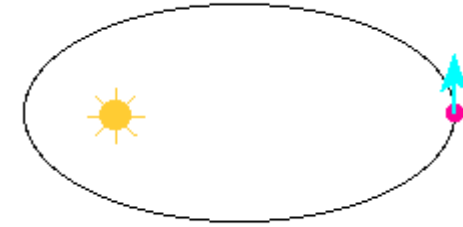
What does this plot tell us about acceleration?



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Acceleration is Vector

Example: planet orbiting Sun



Example: any falling object
special case! Magnitude of the acceleration due to gravity:
symbol g



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Plots are Powerful!

Consider the following Linear Equation

$$P = \frac{NkT}{V}$$

If you plotted P versus V , what would the slope represent?

