Graphs

* Graphs are an incredibly powerful tool for physics.
* I want to start by having you think about graphs. In your groups, take about 15 minutes and come up with answers to as many of the questions as you can.

Three Ways to Get Information from a Graph

* Read a point or points
* Slope
* Area under graph

Velocity vs Time Graph

* What does reading a point or points tell you?
  + Duh, velocity at a moment in time or change in velocity
* Slope?
  + Slope is always rise over run. So look at the “rise” and the “run.” The “rise” is change in velocity. The “run” is time or change in time. That is acceleration. This is a process you can use to figure out what the slope means for any graph.
* Area?
  + Area at its most basic level is length (or height) times width. Similar to slope, what would the “height” be? (Velocity) What would the “width” be? (Time). What is velocity times time? (Change in position or Displacement) Again, a process you can use for any graph.
  + Note, you cannot tell actual position here. What would you need? (Starting position)

Acceleration vs. Time Graphs

* Points…. Duh acceleration or change in acceleration
* Slope…. Jerk
* Area…. Change in velocity

Position vs. Time Graphs

* Points…. Duh position or change in position aka displacement
* Slope…. Velocity
* Area…. Nothing

What About Equations like The Big Five?

* Derive one or two of Big Five

What About Qualitative Analysis?

* What would a graph look like for each of the following if (a) it’s a position vs time graph or (b) it’s a velocity vs time graph?
  + An object at rest
  + An object moving at a constant velocity? (I added moving here.)
  + An object increasing in speed? Decreasing in speed?
  + An object changing direction?
  + Where is an object?
  + How fast is it traveling?