Graphing Summary
**Graphing Key:** Time is always on the horizontal axis. The graphs will often be plotted in groups of three. X on top, then V, finally A.

- Take the slope (derivatives)
- Find the area under the curve (integrals)

Diagram:
- **X** [m]
- **V** [m/s]
- **A** [m/s²]
Math: Taking the slope of the curve
Graphing Position vs. Time (x vs. t)

- slope = velocity
- Object is moving away from origin when slope is positive.
- Area under curve = no meaning
- To find average velocity between two times – read positions off graph then use:
  \[
  \bar{v} = \frac{\Delta x}{\Delta t}
  \]
- To find average speed – determine total distance (account for backtracking) then use:
  \[
  \bar{s} = \frac{d}{\Delta t}
  \]
Graphing Velocity vs. Time (v vs. t)

- slope = acceleration
- Area under curve = displacement
- Object is stopped when v = 0 NOT when slope is zero.
- Object is moving away when the graph is above the x-axis (& towards when below the x axis).
- Object is getting faster when graph moves away from v = 0.
  (both graphs show increasing speed)
Graphing Acceleration vs. Time (a vs. t)

- slope = no meaning
- Area under curve = change in velocity