Graph Types and Linearization Notes

Goals:

- Recognize multiple forms of graphs
- Understand linear relationship lines are nicer to deal with
- Be able to convert non-linear graphs into linear ones through a process of "linearization"

What types of graphs or shapes do you know?

- Focus on FIRST quadrant
- Linear, Parabola, Hyperbola (Inverse function), Side-opening parabola

Can't have a naked graph! – LABEL axes

- Linear: Circumference versus Diameter
- Parabola: Energy versus velocity
- Hyperbola: Acceleration versus Mass
- Side-opening: Final velocity versus Distance

What is the best and easiest shape to draw?

- Now, what happens when we want to draw our best-fit line?
 - More difficult to draw a non-straight line
 - We like straight lines let's make the graphs straight lines Linearize!

If graph is...

- …linear
 - \circ form y prop mx + b or in our case C prop d
- …parabolic
 - \circ form y prop x² or in our case E prop v²
 - \circ Graph E versus v²
 - $\circ E = m(v^2) + b$
- …hyperbolic
 - \circ form y prop 1/x or in our case a prop 1/m
 - o Graph a versus 1/m
 - $\circ \quad A = m (1/m) + b$
- Side-opening
 - o form y^2 prop x or in our case vf^2 prop a
 - Graph vf^2 versus a
 - $\circ \quad Vf^{2} = m(a) + b$