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
  - form y prop mx + b or in our case C prop d
- …parabolic
  - form y prop x^2 or in our case E prop v^2
  - Graph E versus v^2
  - E = m(v^2) + b
- …hyperbolic
  - form y prop 1/x or in our case a prop 1/m
  - Graph a versus 1/m
  - a = m (1/m) + b
- Side-opening
  - form y^2 prop x or in our case vf^2 prop a
  - Graph vf^2 versus a
  - vf^2 = m (a) + b