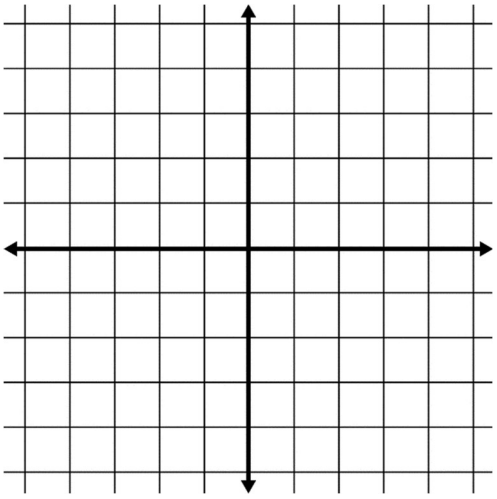
Graphs of Equations

- *Graph of an equation* is the set of all points (*x, y*) that are solutions of the equation.
  - EX: Determine whether (a) (2, 0) (b) (-2, 8) lie on the graph of $y = x^2 - 3x + 2$.

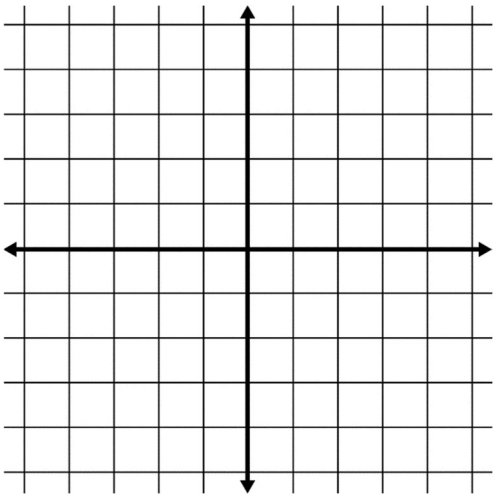
- Most basic method of graphing an equation – Point plotting
  - Isolate one of variables, if possible
  - Construct table of values
  - Plot these points
  - Method very limiting and *basic*
  - EX: Sketch the graph of $y + 3x = x^2$



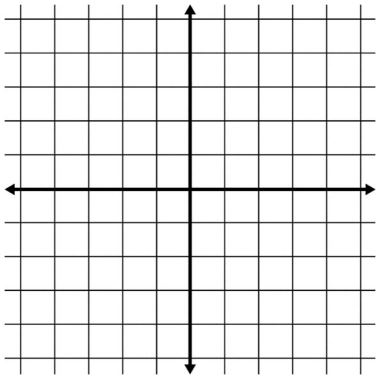
  - Why is this method limiting?
  - Note: To graph in calculator, you must isolate the *y* on the left side, then enter into Y =

- *Intercepts*
  - *x*-intercepts: (___, 0) Put 0 in for *y* and solve for *x*.
  - *y*-intercepts: (0, ___) Put 0 in for *x* and solve for *y*.
  - Note: Not all equations have one or both intercepts, and some have multiple of each.
  - Remember: Intercepts are *POINTS* (*x*, *y*)
  - EX: Identify intercepts of $3x + 2y = 6$

- *Symmetry*
  - Symmetric with the *x*-axis if you substitute *-y* in for *y*, and get equivalent equation
  - Symmetric with the *y*-axis if you substitute *-x* in for *x*, and get equivalent equation
  - Symmetric with the *origin* if you substitute *-x* in for *x*, *-y* in for *y*, and get equivalent equation
  - EX: Test $y = x^2 - 2$ for symmetry, and graph.



  - EX: Sketch the graph of $y = |x + 2|$



- *Circles*: Directly related to the distance formula.
  - Standard Form of the Equation of a Circle
    - $(x - h)^2 + (y - k)^2 = r^2$
    - (h, k) represents the center, *r* represents the radius
  - What would equation be if centered at orgin?
  - EX: The point (3, 4) lies on a circle whose center is at (–1, 2). Write the standard form of the equation of this circle.