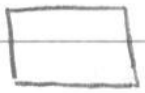
Lesson 6: Rectangular Coordinate System Graphing Linear Equations in One Variable

- What is the rectangular coordinate system?
  - Think of a rectangle

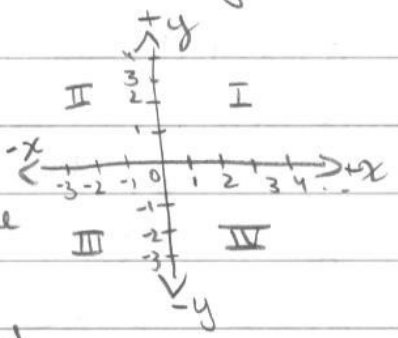


← has 2 dimensions, vertical and horizontal, which are perpendicular to one another

  - coordinates are like location. In 2 dimensions, we need 2 coordinates, one specifying horizontal distance from some point, and one specifying vertical distance. The point from which the distances are taken is the reference point.

Rectangular Coordinate system (aka Cartesian plane)

x axis is # line, y axis is # line



x and y are crossed at their 0 points

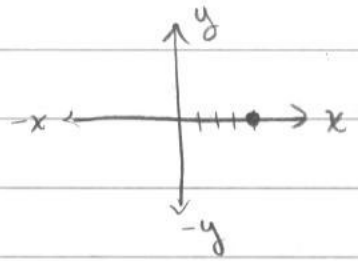
x axis is horizontal measure

y axis is vertical measure

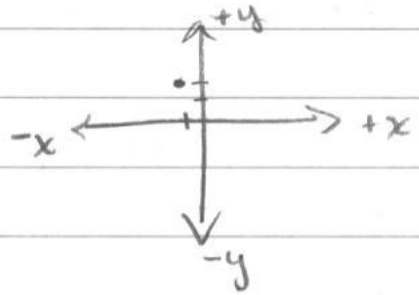
Intersection point is reference point, which we call the origin. Points on this plane are given a notation (x, y), x being horizontal distance from (0, 0) and y being vertical

Quadrants are fourths of the plane. They are numbered by Roman numerals on the above picture.

ex: (4, 0) ← go 4 to the +x side, and 0 up/down

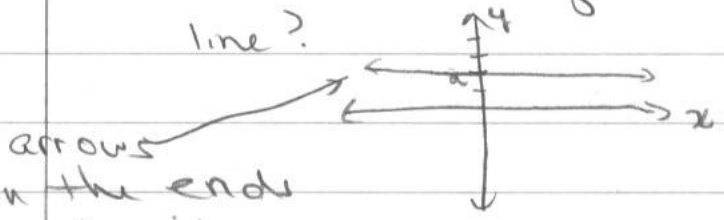


(-1, 2) ← go 1 to the -x side, and 2 to the +y side



What is a line? An infinite row of points.

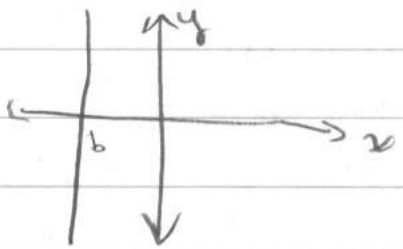
- what is the equation for a horizontal line?



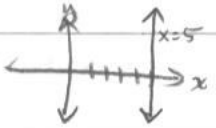
arrows on the ends indicate it goes on forever in that direction

★ notice every point on the line, regardless of its x value, has the same y-value. Thus, the line's equation is $y = a$ (a is the y-coord)

- what is the equation for a vertical line?



notice, every point has same x-coordinate but y varies. Thus, this is $x = b$, where b is the x-coordinate.

ex. $x = 5$ 

$y = 3$