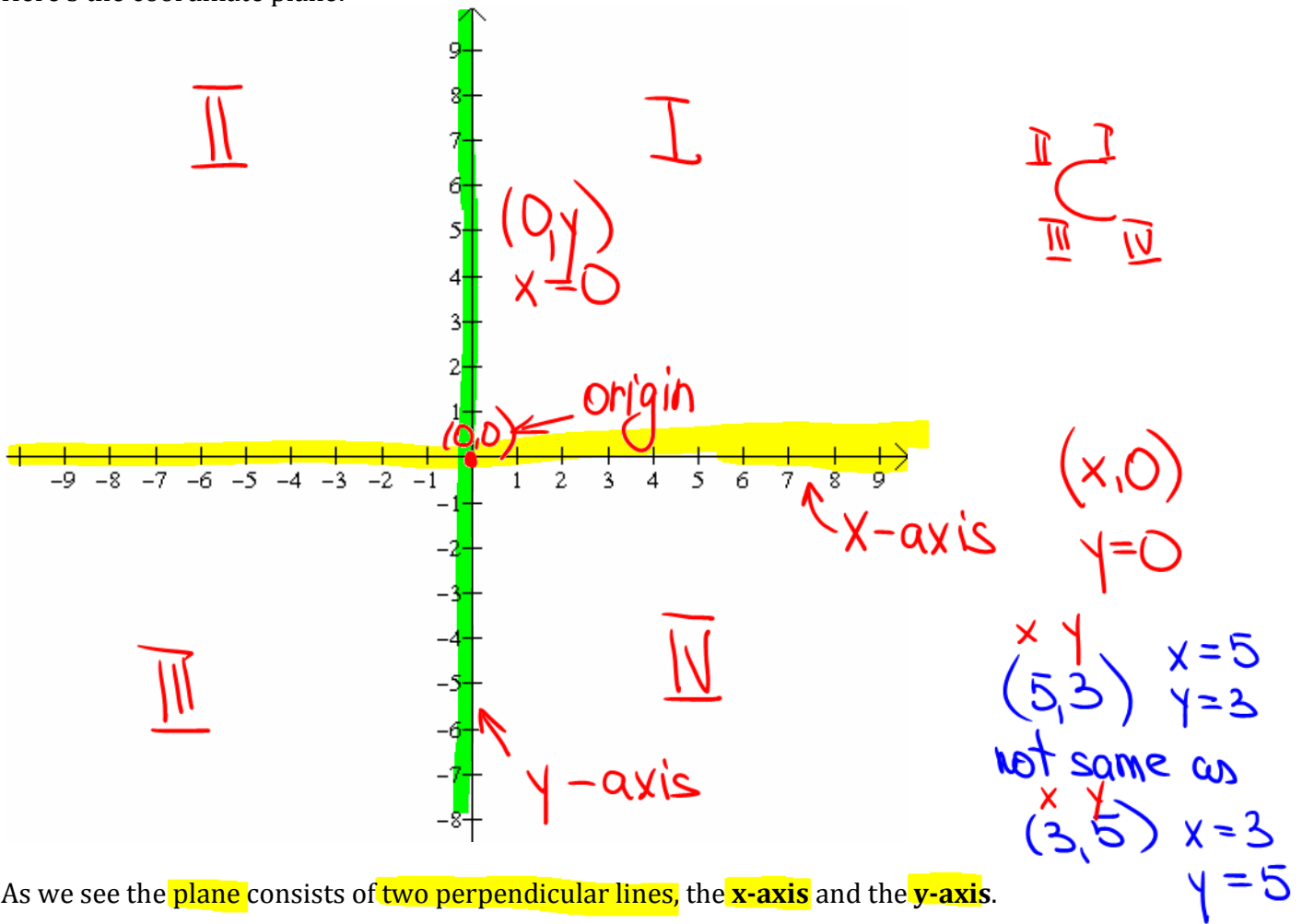


Section 2.1: The Coordinate Plane

Here's the coordinate plane:



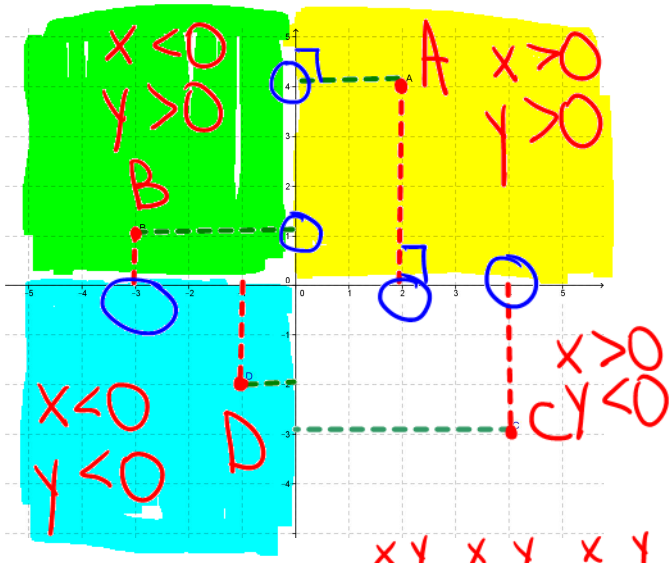
As we see the plane consists of two perpendicular lines, the x-axis and the y-axis.

These two lines separate them into four regions, or **quadrants**.

The pair, (x, y) , is called an **ordered pair**. The first number is called the **x coordinate**, and the second number is called the **y coordinate**. The ordered pair $(0, 0)$ is referred to as the **origin**. The **x coordinate** tells us the horizontal distance a point is from the origin. The **y coordinate** tells us the vertical distance a point is from the origin. You'll move right or up for positive coordinates and left or down for negative coordinates.

Quad.

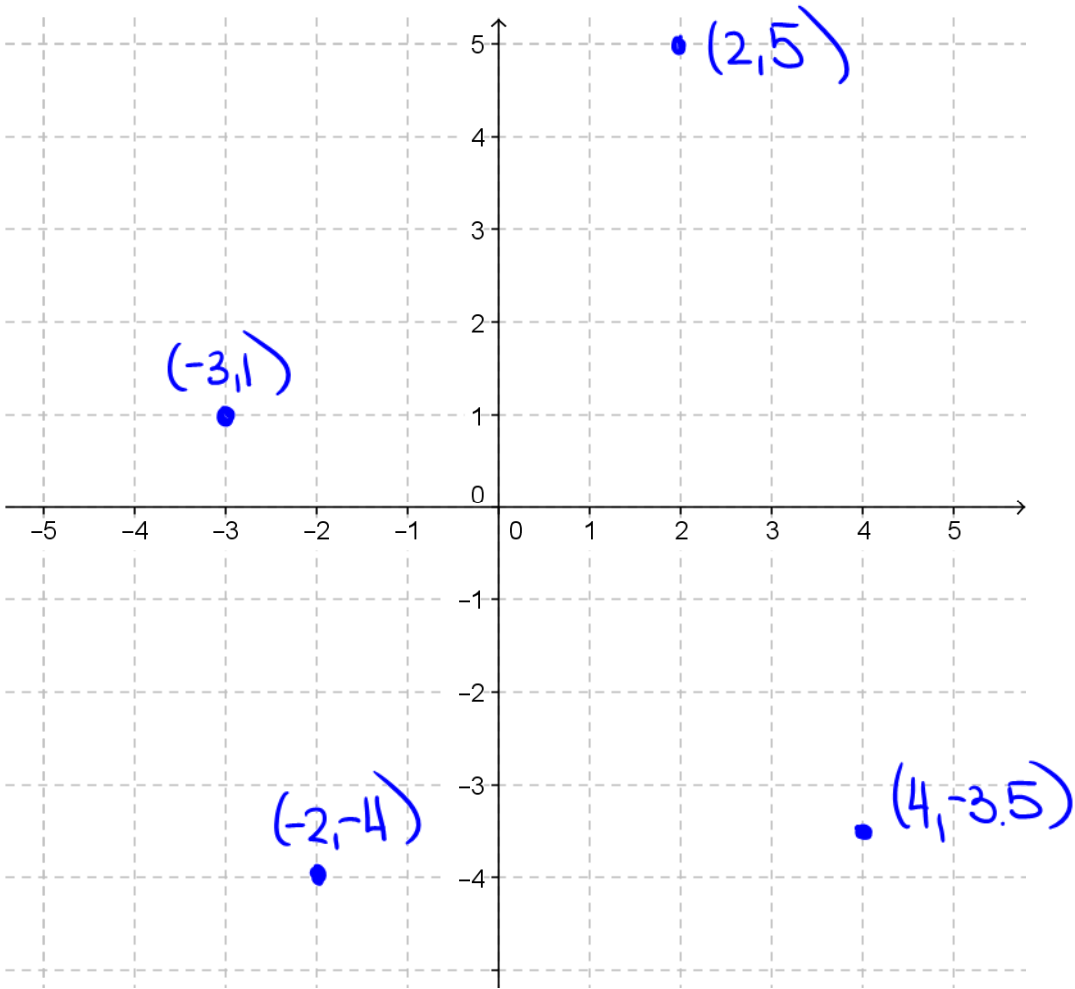
Example 1: Identify the following points.



- A (2,4) I
- B (-3,1) II
- C (4,-3) III
- D (-1,-2) IV

x y x y x y x y

Example 2: Plot the points (-3,1), (4, -3.5), (-2, -4) and (2,5)



Graphing Horizontal and Vertical Lines

Example 3: Graph the lines $y = 3$ and $y = 0$.



$y=0 \Rightarrow$ x-axis

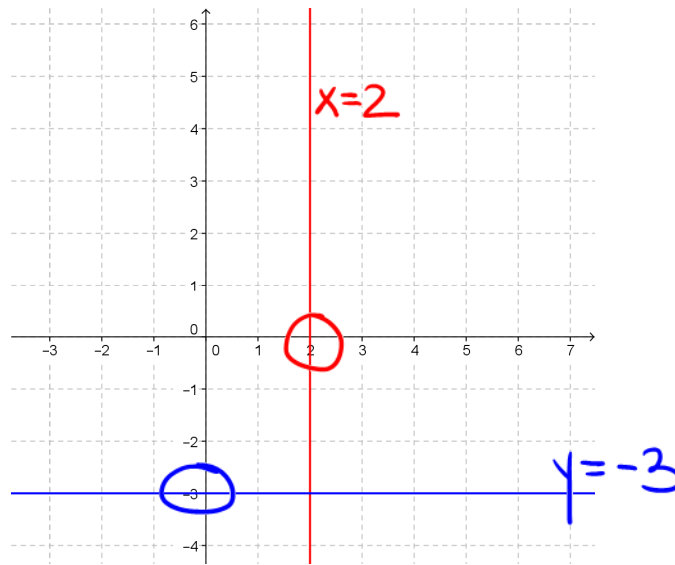
$y=3 \Rightarrow$ horizontal

Example 4: Graph the lines $x = -3$ and $x = 1$.



$x = \text{number} \Rightarrow$ vertical

Example 5: What are the equations of the given lines?



$$\left| \frac{1}{2}x + \frac{5}{6} \right| = \frac{2}{3}$$

$$\begin{matrix} x = -\frac{1}{3} \\ x = -3 \end{matrix}$$

$$|x| = c \quad c \rightarrow \text{positive}$$

$$x = \pm c$$

$$\begin{matrix} \swarrow & \searrow \\ \frac{1}{2}x + \frac{5}{6} = \frac{2}{3} & \frac{1}{2}x + \frac{5}{6} = -\frac{2}{3} \end{matrix}$$

$$|x| = 0 \quad x = 0$$

$$|x| = c \quad c \rightarrow \text{negative}$$

No solution!

$$\begin{matrix} 3x + 5 = 4 \\ -5 \quad -5 \end{matrix}$$

$$\begin{matrix} 3x + 5 = -4 \\ -5 \quad -5 \end{matrix}$$

$$\begin{matrix} 3x = -1 \\ \frac{3}{3} \quad \frac{3}{3} \\ x = -\frac{1}{3} \end{matrix}$$

$$\begin{matrix} 3x = -9 \\ \frac{3}{3} \quad \frac{3}{3} \\ x = -3 \end{matrix}$$