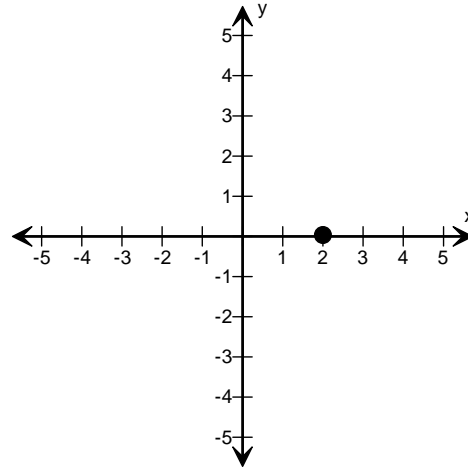
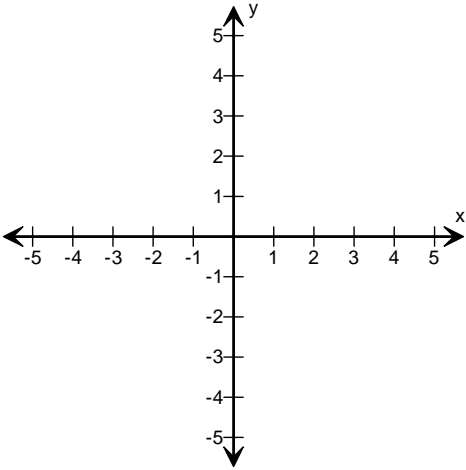


## Vertical Lines:

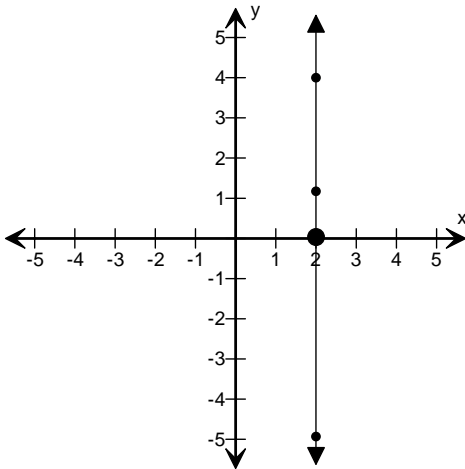
A vertical line is a line whose equation is of the form  $x=k$ . Let's look at a picture to see what this means.

Example: Say you're given  $x=2$ .

- 1) Draw a coordinate system      2) Mark  $x=2$  on the horizontal axis



- 3) Draw a vertical line through  $x=2$ .      4)  $x=2$  is a line. Because the letter  $y$  is not written in the equation, its value can be anything.



These are some points on the line:

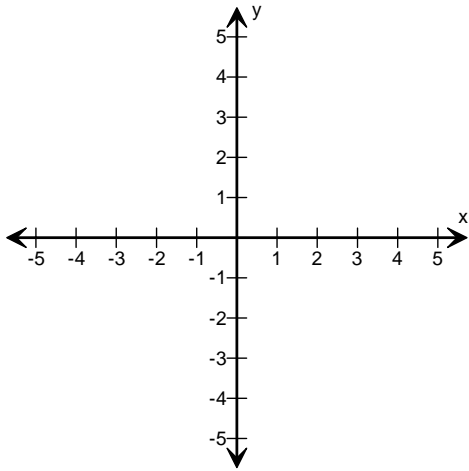
$(2,4)$  and  $(2,-5)$  and  $(2,1)$

## Horizontal Lines:

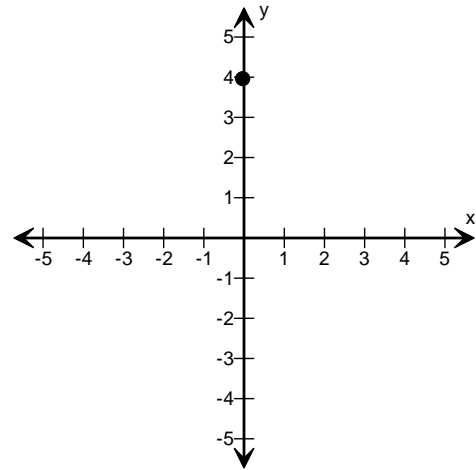
A horizontal line is of the form  $y=k$ .  $k$  is a number we can change.

Say we have to plot  $y=4$

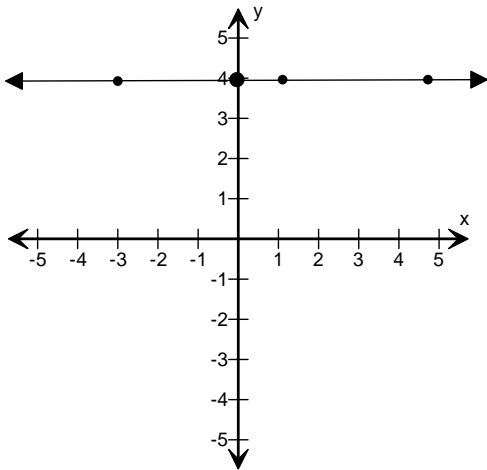
1) Draw a coordinate system



2) Mark  $y=4$  on the vertical axis.



3) Draw a horizontal line through  $y=4$



4)  $y=4$  is a line. Because the letter  $x$  is not written in the equation, it's value can be anything.

These are some points on the line:

$(-3,4)$  and  $(1,4)$  and  $(5,4)$

Slope of a line:

1) Slope measures the steepness of a line.

2) If you're given two points, you can find the slope of a line using the

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

Example 1: Say you're given the two points (4,5) and (7,8)

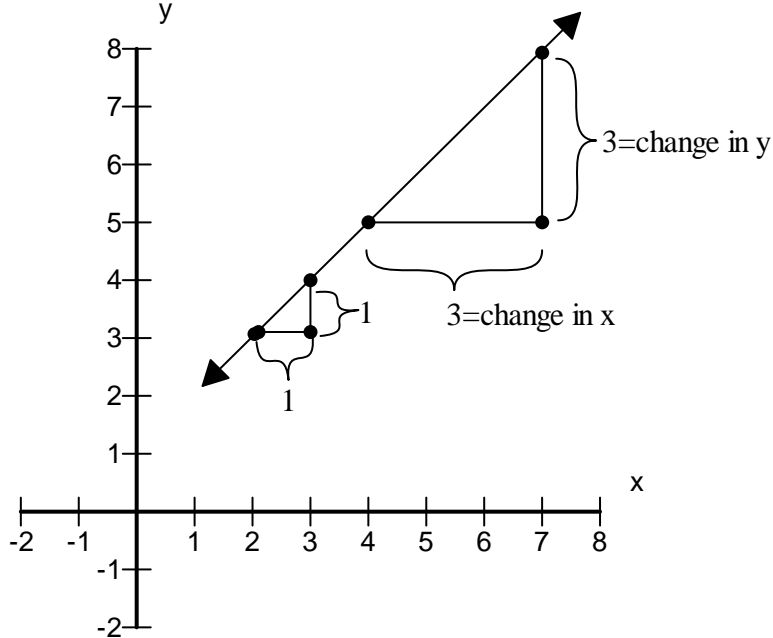
a. Rewrite the points so the roles of the numbers are clear.

( $x_1=4, y_1=5$ ) and for the second point we have ( $x_2=7, y_2=8$ )

b. Form and simplify the expression for the slope.

$$\text{slope} = \frac{8-5}{7-4} = \frac{3}{3} = \frac{1}{1} \quad \text{slope is ALWAYS TWO numbers}$$

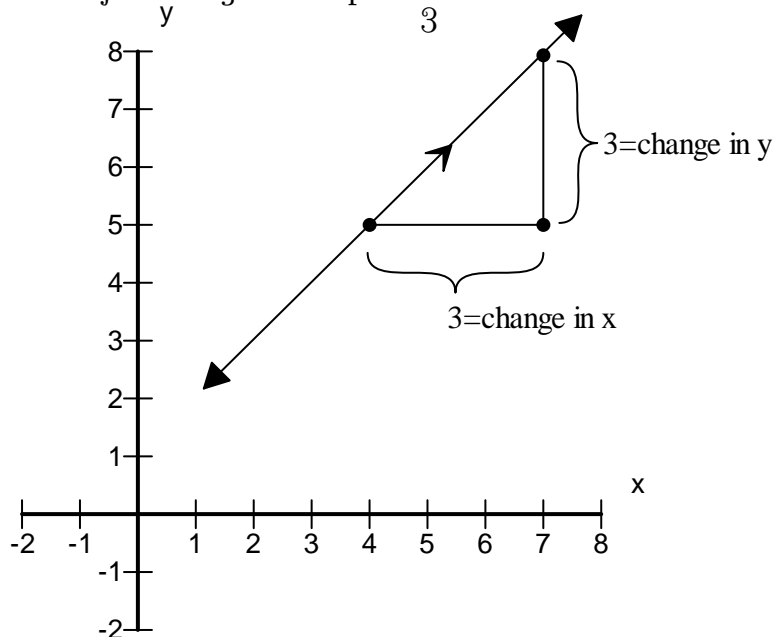
c. Draw a picture to represent the meaning of  $\frac{1}{1}$



## Examples of slope:

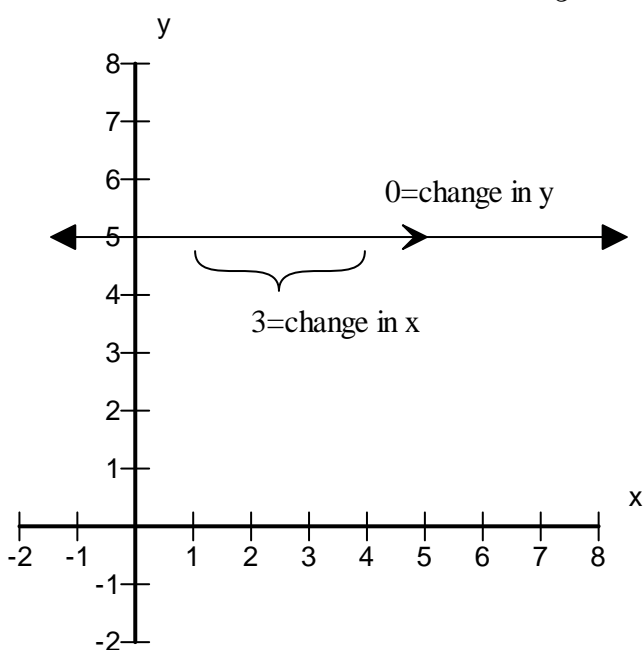
- 1) Slope can be positive. In a picture, this means a line goes up from

left to right.  $\text{slope} = \frac{3}{3}$



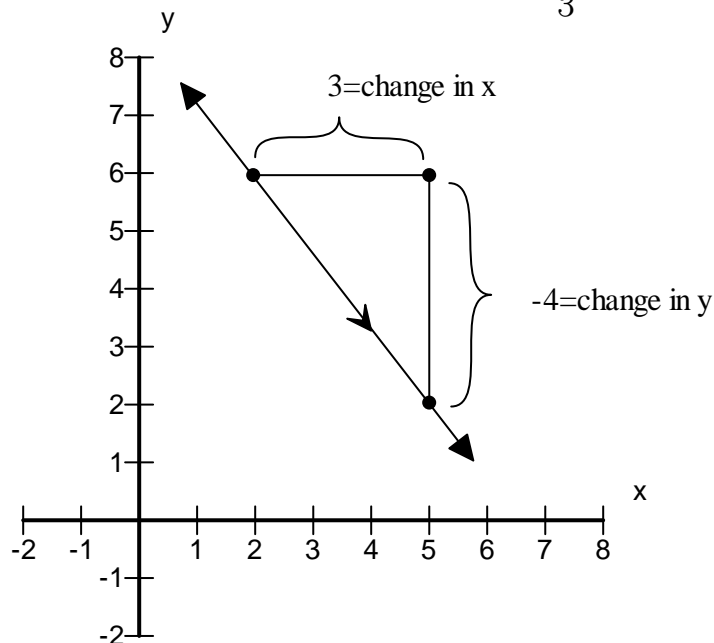
## Examples of slope:

- 3) Slope can be 0. This means the line is horizontal.  $\text{slope} = \frac{0}{3} = 0$



## Examples of slope:

- 2) Slope can be negative. In a picture, this means a line falls as we look at it from left to right.  $\text{slope} = \frac{-4}{3}$



## Examples of slope:

- 4) Slope can be undefined. This means the line is vertical.  $\text{slope} = \frac{3}{0} = \text{undefined}$

