Concepts and Examples Horizontal and Vertical Lines

Based on power point presentations by Pearson Education, Inc.
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Learning Objectives

1. Write and graph horizontal lines.
2. Write and graph vertical lines.

1. The Equation of a Horizontal Line (1 of 3)

We will now discuss two equations in two variables which, at first glance, don't seem to consist of two variables. First, we will discuss **horizontal lines** and then **vertical lines**.

The **general form** of a **Horizontal Line** is

$y = b$ where b can be any real number

There is no x-variable in this equation!!! However, it is still considered an equation in two variables **as long as you are told it is one.**

For example, the line $y = 3$ is horizontal.

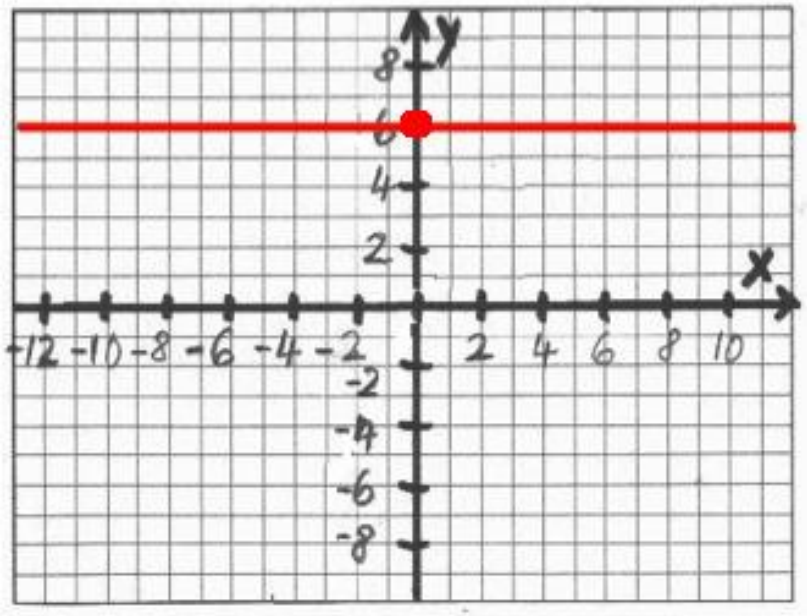
The graph of this horizontal line is parallel to the x-axis where b **is the** y**-intercept** and the ordered pair associated with the y-intercept is $(0, b)$.

The Equation of a Horizontal Line (2 of 3)

Example 1:

Graph the line $y = 6$ by hand.

We are told that $y = 6$ is a line. From the equation we know that we are dealing with a horizontal line parallel to the x-axis. We note that $b = 6$ which is the y-intercept. Therefore, the ordered pair associated with this intercept is (0, 6). Let's plot this ordered pair and then simply draw a horizontal line through it that is parallel to the x-axis.



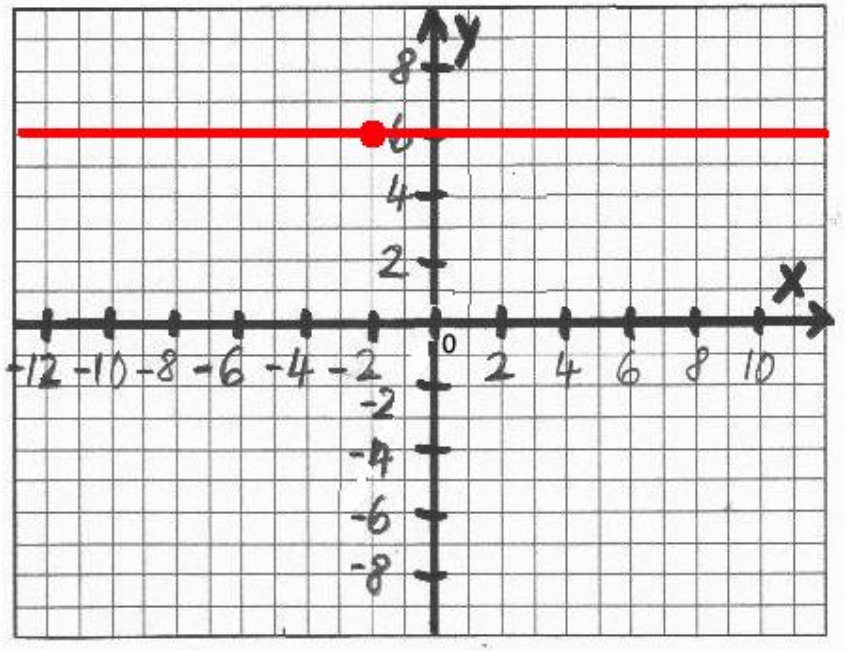
You MUST memorize that the general equation of a horizontal line is ***y = b*** where ***b*** can be any real number.

The Equation of a Horizontal Line (3 of 3)

Example 2:

Write an equation of a horizontal line through the point created by the ordered pair (– 2, 6).

To help is with the task, let's plot the ordered pair (– 2, 6) and then draw a horizontal line through it that is parallel to the *x*-axis.



We know that a horizontal line has an equation of ***y = b***, where ***b*** is the *y*-intercept of the line.

In the graph, we see that the *y*-intercept is 6.

Therefore, the equation of the horizontal line through the point created by the ordered pair (– 2, 6) must be ***y* = 6**.

2. The Equation of a Vertical Line (1 of 3)

The **general form** of a **Vertical Line** is

x* = *a where ***a*** can be any real number

There is no *y*-variable in this equation!!! However, it is still considered an equation in two variables **as long as you are told it is one.**

For example, the line $x = -1$ is vertical.

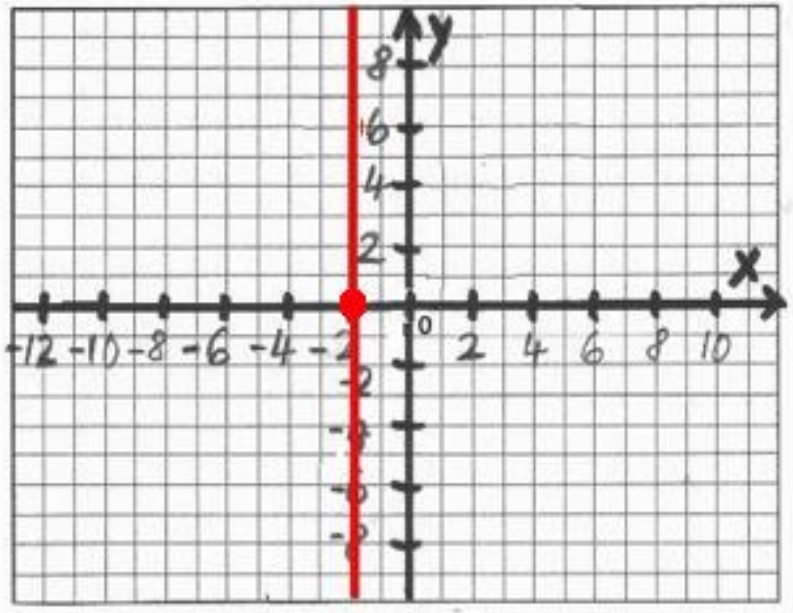
The graph of this vertical line is parallel to the *y*-axis where ***a* is the *x*-intercept** and the ordered pair associated with the *x*-intercept is **(*a*, 0).**

The Equation of a Vertical Line (2 of 3)

Example 3:

Graph the line $x = -2$ by hand.

We are told that $x = -2$ is a line. From the equation we know that we are dealing with a vertical line parallel to the y-axis. We note that $a = -2$ which is the x-intercept. Therefore, the ordered pair associated with this intercept is $(-2, 0)$. Let's plot this ordered pair and then simply draw a vertical line through it that is parallel to the y-axis.



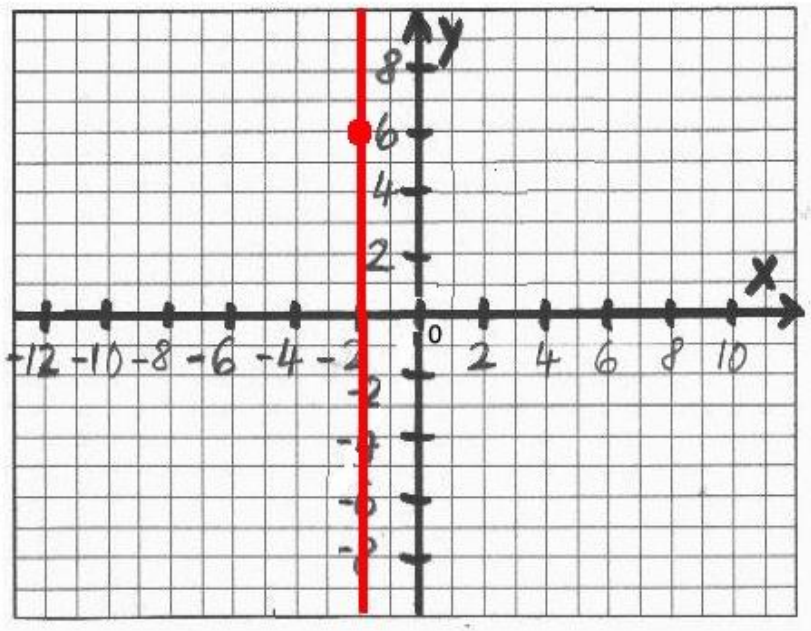
You MUST memorize that the general equation of a vertical line is ***x = a*** where ***a*** can be any real number.

The Equation of a Vertical Line (3 of 3)

Example 4:

Write an equation of a vertical line through the point created by the ordered pair (– 2, 6).

To help is with the task, let's plot the ordered pair (– 2, 6) and then draw a vertical line through it that is parallel to the *y*-axis.



We know that a vertical line has an equation of ***x = a***, where ***a*** is the *x*-intercept of the line.

In the graph, we see that the *x*-intercept is – 2 .

Therefore, the equation of the vertical line through the point created by the ordered pair (– 2, 6) must be ***x = – 2*** .