

HORIZONTAL AND VERTICAL LINES

- Want some other practice with lines?

[Introduction to the Slope of a Line](#)

[Practice with Slope](#)

[Graphing Lines](#)

[Finding Equations of Lines](#)

[Point-Slope Form](#)



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Vertical and horizontal lines have equations that are *simpler* than all other lines!

Vertical lines have equations of the form ‘ $x = \text{some number}$ ’.

Horizontal lines have equations of the form ‘ $y = \text{some number}$ ’.

Why? Keep reading!

Since they're commonly mixed up, two memory devices are offered, so you'll always get them right.

VERTICAL LINES

The points (x, y) that satisfy the equation $x = 3$ (that is, $x + 0y = 3$) are all points of the form $(3, y)$, where y can be any real number.

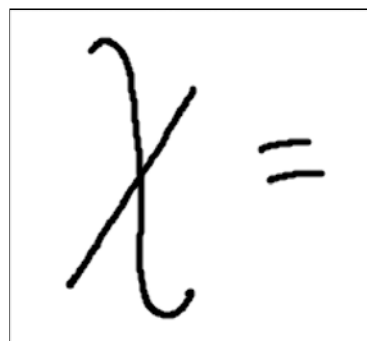
This is the vertical line that crosses the x -axis at 3.

That is, in order to satisfy the equation $x = 3$, the x -value of a point must be 3.

The y -value can be anything it wants to be.

To get to any of these points from the origin, you move 3 units to the right, and then up/down to your heart's content.

Memory Device for Vertical Lines



As a memory device, you might think of exaggerating the first stroke of the x to make a vertical line.

HORIZONTAL LINES

The points (x, y) that satisfy the equation $y = 3$ (that is, $0x + y = 3$) are all points of the form $(x, 3)$, where x can be any real number.

This is the horizontal line that crosses the y -axis at 3.

That is, in order to satisfy the equation $y = 3$, the y -value of a point must be 3.

The x -value can be anything it wants to be.

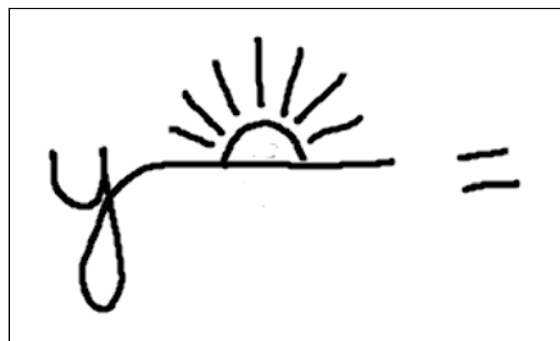
To get to any of these points from the origin,

you must move up 3 units;

you can move left/right to your heart's content.

Draw a rising sun to remind you of the horizon!

Memory Device for Horizontal Lines



As a memory device, you might think of exaggerating the y to make a horizontal line.

HORIZONTAL AND VERTICAL LINES

Let k be a real number.

Equations of the form $x = k$ graph as vertical lines.

The y -axis is a vertical line; its equation is $x = 0$.

All other vertical lines are parallel to the y -axis.

All vertical lines are perpendicular to the x -axis.

Vertical lines have no slope; i.e., the slope is not defined.

Equations of the form $y = k$ graph as horizontal lines.

The x -axis is a horizontal line; its equation is $y = 0$.

All other horizontal lines are parallel to the x -axis.

Horizontal lines are perpendicular to the y -axis.

Horizontal lines have slope 0 (zero).

EXAMPLES:

Question:

Write the equation of the horizontal line that passes through the point $(3, -2)$.

Answer: $y = -2$

Question:

Write the equation of the line through $(3, -2)$ that is perpendicular to the x -axis.

Answer: $x = 3$