**Reading a Line Equation and Plotting It**

**In the equation - mx + b , m = the slop and b = the point on the y axis**

**If the slope is a positive number, such as 2, read it as 2/1. Two up the y axis, 1 one over to the right on the x axis.**

**If the slope is a negative number, such as -2, read it as -2/1. Two down the y axis, one over to the right on the x axis. *You can read it as two up the y axis and one over to the LEFT on the x axis. The line that is created will be the same.***

**Graph the equation *y* = ( 3/5 ) *x* – 2 from the slope and *y*-intercept.**

[From the equation](http://www.purplemath.com/modules/strtlneq.htm), I know that the slope is *m* = 3/5, and that the line crosses the *y*-axis at  
*y* = –2. Copyright © Elizabeth Stapel 2000-2011 All Rights Reserved

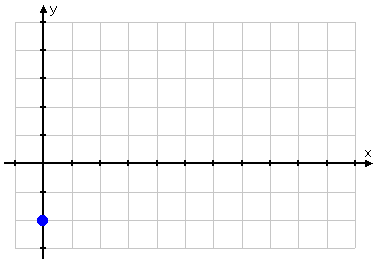
|  |  |  |
| --- | --- | --- |
|  |  | y-intercept at y = -2 |
| From this point, I go up three and over five: |  | 'up two and over three' to get the second point |

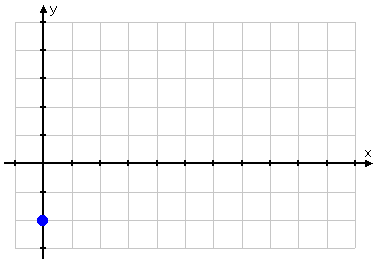
When graphing a negative slope, which means the number in front of ‘x’ is negative, the line will run from top left to down right.

* **Graph the equation *y* = -2 *x* + 4 from the slope and *y*-intercept.**

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|  |  |  |
| --- | --- | --- |
| I'll start by plotting this first point: |  |  |
|  |  |  |

Now the second.



**One common line to graph is the parabola—a U shape (upper Geometry)**

You **probably won’t** be asked to graph it, but you might be asked to identify if the equation for a vertical one and a horizontal one.

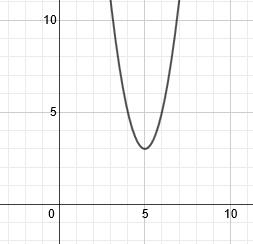
Remember the patterns: http://www.softschools.com/math/calculus/images/understanding_parabolas_img2.png

If ‘a’ is positive, U goes up or U goes to the right. If ‘a’ is negative, U goes down or U goes to the left.

Vertical means the U up or down

Horizontal means the U is side to side, or lying flat

1. Find the equation of this parabola



This is a vertical parabola, so we are using the pattern http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img2.png  
  
Our vertex is (5, 3), so we will substitute those numbers in for h and k:

http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img3.png

Now we must choose a point to substitute in. You can choose any point on the parabola except the vertex. Let's use (4, 5). We'll substitute 4 in for x and 5 for y.

http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img4.png  
  
http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img5.png

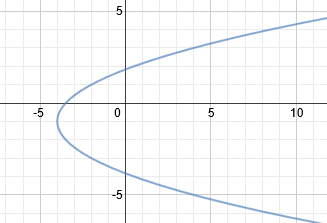
Now we'll solve for a:

http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img6.png  
  
http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img7.png

5 = a(1) + 3  
  
2 = a

To finish, we rewrite the pattern with h, k, and a:http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img8.png

2. Find the equation of the parabola:



This is a vertical parabola, so we are using the pattern http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img10.png  
  
Our vertex is (-4, -1), so we will substitute those numbers in for h and k:

http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img11.png  
  
http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img12.png

Now we must choose a point to substitute in. You can choose any point on the parabola except the vertex. Let's use (4, 3). We'll substitute 4 in for x and 3 for y.

http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img12.png  
  
http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img13.png

Now we'll solve for a:

http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img14.png  
  
http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img15.png

4 = a(16) - 4  
  
8 = 16a  
  
1/2 = a  
  
To finish, we rewrite the pattern with h, k, and a:http://www.softschools.com/math/calculus/images/writing_the_equation_of_parabolas_img16.png

**Practice:** Find the equation of these parabolas.

