
GRAPHING ABSOLUTE VALUES

□ INTRODUCTION

It's time to do more graphing -- of course, this time there will be absolute values in the formula.

EXAMPLE 1: **Graph:** $y = |x - 3| + 2$

Solution: Don't panic! Let's just do what we've done a few times before: pick x -values off the top of our head, calculate the associated y -values, plot the points (x, y) , and see what we get.

Setting x to 0 gives $y = |0 - 3| + 2 = |-3| + 2 = 3 + 2 = 5$.

We now have our first point on the graph: $(0, 5)$.

Now set x to 7: $y = |7 - 3| + 2 = |4| + 2 = 4 + 2 = 6$.

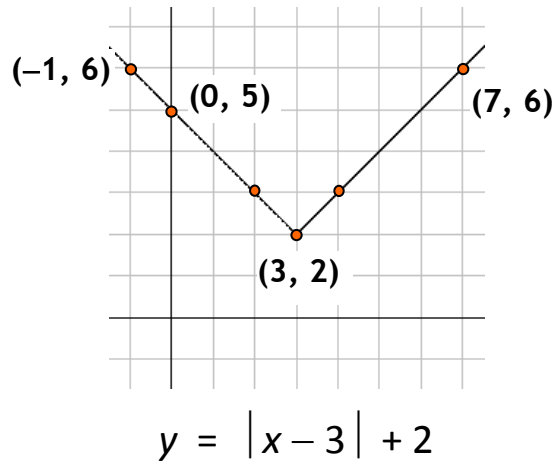
Our new point on the graph is $(7, 6)$.

One more -- set x to -1 : $y = |-1 - 3| + 2 = |-4| + 2 = 4 + 2 = 6$.

Our third point is $(-1, 6)$.

We'll now construct an x - y table using the three points we've just calculated and some more points; it's your job to verify the rest of the points.

x	y
-1	6
0	5
1	4
2	3
3	2
4	3
5	4
6	5
7	6



Notice that the graph is certainly not a line; it's in the shape of a "V." It is sharp at its bottom point $(3, 2)$, not smooth and curvy like the graph of the parabola $y = x^2$ that you may have seen before.

Homework

1. Graph: $y = |x|$
2. Graph: $y = |x| + 3$
3. Graph: $y = |x| - 4$
4. Graph: $y = |x + 2|$
5. Graph: $y = |x - 5|$
6. Graph: $y = |x + 3| - 4$

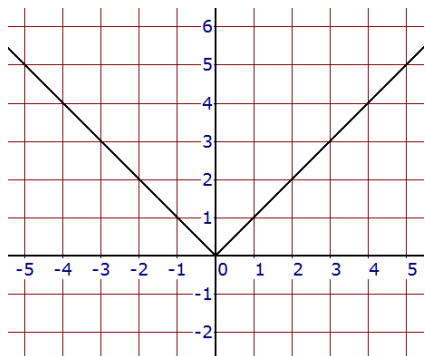
The absolute value of a positive number is itself.

The absolute value of 0 is 0.

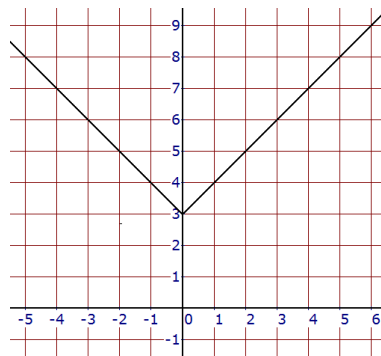
The absolute value of a negative number is its opposite.

Solutions

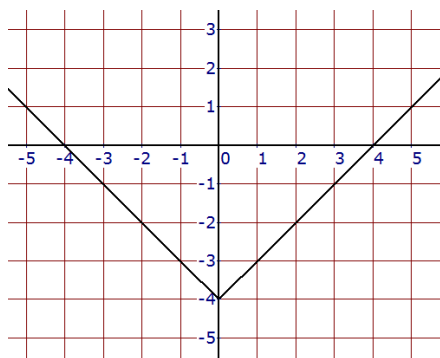
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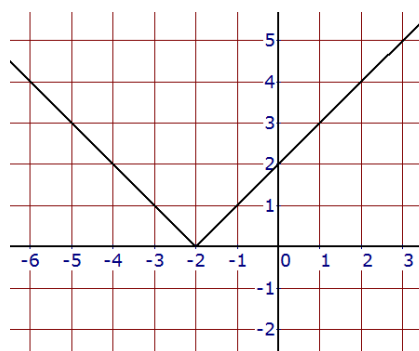
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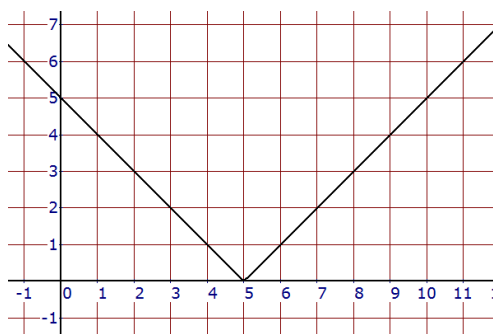
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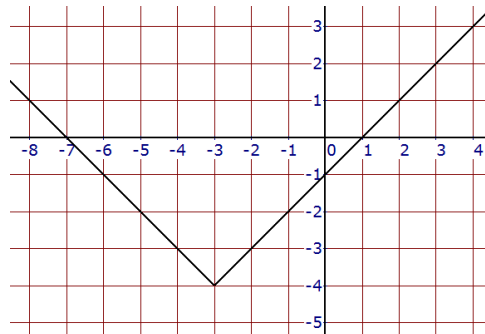
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5.



6.



“The aim of education is the knowledge, not of facts, but of values.” — William S. Burroughs