

Reteaching 2-5

Absolute Value Functions and Graphs

OBJECTIVE: Graphing absolute value functions

MATERIALS: Graph paper, ruler

A function of the form $f(x) = |mx + b|$ is an *absolute value function*.

The graph of $f(x) = |mx + b|$ looks like an angle; its vertex is located at the point $\left(-\frac{b}{m}, 0\right)$.

Example

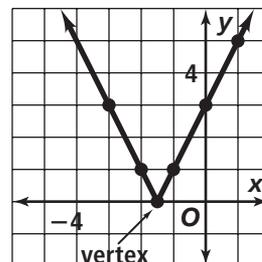
Graph $f(x) = |2x + 3|$.

First find the vertex. Using the form $\left(-\frac{b}{m}, 0\right)$ where $b = 3$ and $m = 2$, we obtain the vertex $\left(-\frac{3}{2}, 0\right)$.

Now find several points on the graph of $f(x) = |2x + 3|$. Choose values of x on both sides of the vertex.

x	-3	-2	-1	0	1
y	3	1	1	3	5

Plot the vertex and the points from the table in a rectangular coordinate system. Finish the graph by drawing two rays emanating from the vertex and passing through the other points.



Exercises

Find the vertex of each absolute value function.

1. $f(x) = |5x|$

2. $f(x) = |x + 3|$

3. $f(x) = |x - 4|$

4. $f(x) = |3x + 1|$

5. $f(x) = \left|\frac{1}{2}x - 3\right|$

6. $f(x) = \left|\frac{1}{4}x + 2\right|$

Find the vertex of each absolute value function. Then graph the function by plotting several other points.

7. $f(x) = |2x - 1|$

8. $f(x) = |3x - 1|$

9. $f(x) = |2x + 4|$

10. $f(x) = |x + 1|$

11. $f(x) = |x - 2|$

12. $f(x) = \left|2x - \frac{3}{2}\right|$

13. $f(x) = |3x|$

14. $f(x) = \left|\frac{1}{2}x + 1\right|$

15. $f(x) = \left|\frac{2}{3}x + 2\right|$