Extension

Use after Lesson 6.5

Graph Absolute Value Functions

TEKS A.1.D; 2A.4.A, 2A.4.B

GOAL Graph absolute value functions.

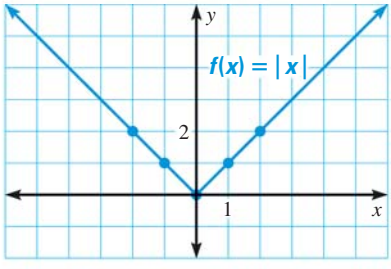
Key Vocabulary
- **absolute value,** *p. 66*

The function $f(x) = |x|$ is an example of an *absolute value function* and is the parent function for all absolute value functions. You can graph absolute value functions by using a table of values, as shown below for $f(x) = |x|$.

KEY CONCEPT *For Your Notebook*

Graph of Parent Function for Absolute Value Functions

x	$f(x) = \|x\|$
−2	$\|-2\| = 2$
−1	$\|-1\| = 1$
0	$\|0\| = 0$
1	$\|1\| = 1$
2	$\|2\| = 2$



EXAMPLE 1 Graph $g(x) = |x - h|$ and $g(x) = |x| + k$

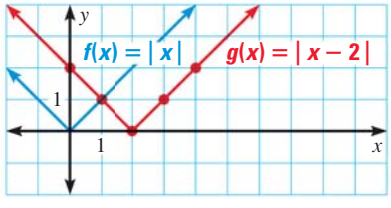
Graph each function. Compare the graph with the graph of $f(x) = |x|$.

a. $g(x) = |x - 2|$

STEP 1 **Make** a table of values.

x	0	1	2	3	4
$g(x)$	2	1	0	1	2

STEP 2 **Graph** the function.



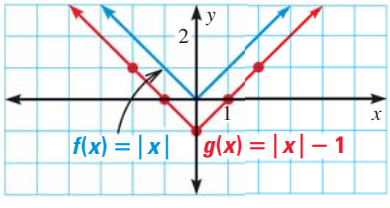
STEP 3 **Compare** the graphs of g and f. The graph of $g(x) = |x - 2|$ is 2 units to the right of the graph of $f(x) = |x|$.

b. $g(x) = |x| - 1$

STEP 1 **Make** a table of values.

x	−2	−1	0	1	2
$g(x)$	1	0	−1	0	1

STEP 2 **Graph** the function.



STEP 3 **Compare** the graphs of g and f. The graph of $g(x) = |x| - 1$ is 1 unit below the graph of $f(x) = |x|$.

APPLY TRANSFORMATIONS

The two graphs in Example 1 are translations of the graph of $f(x) = |x|$. The graph in part (a) is a horizontal translation. The graph in part (b) is a vertical translation.