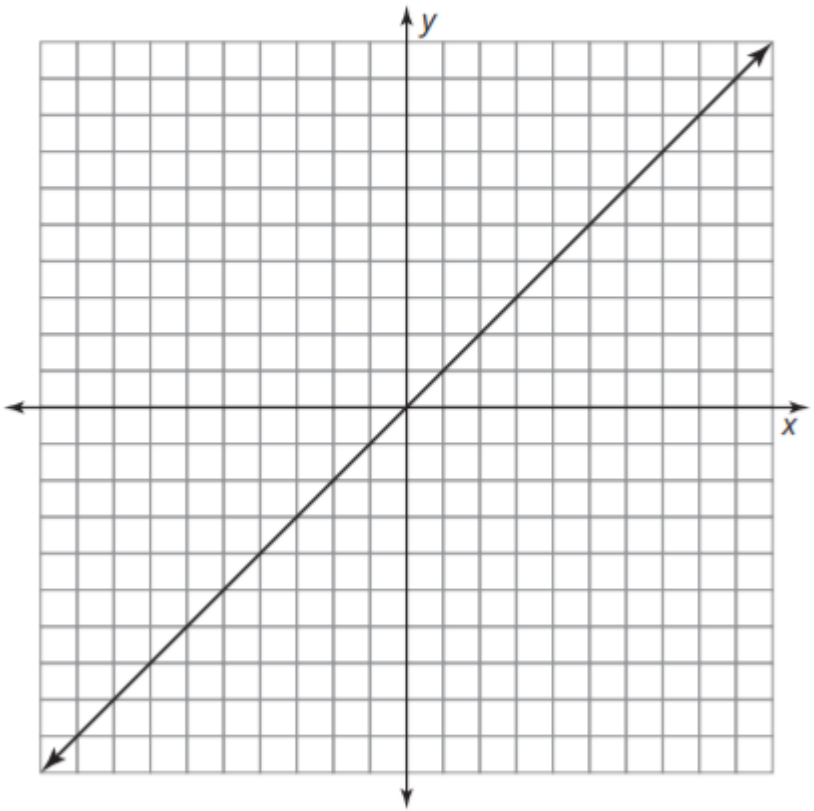
Warm Up

The graph of $f(x) = x$ is shown. Graph each transformation.



1. $g(x) = f(x) + 5$

Absolute value is indicated with vertical bars: $|-4|$ is read as "the absolute value of -4."

The **absolute value** of a number is its distance from zero on the number line.

1. Follow your teacher's instructions to model each absolute value expression on the *x*-axis of a classroom coordinate plane. Rewrite each expression without the absolute value symbol.

a. $|-2|$

b. $|2|$

c. $|1 - 2|$

d. $|-3 - (-5)|$

e. $|-2 \cdot 3|$

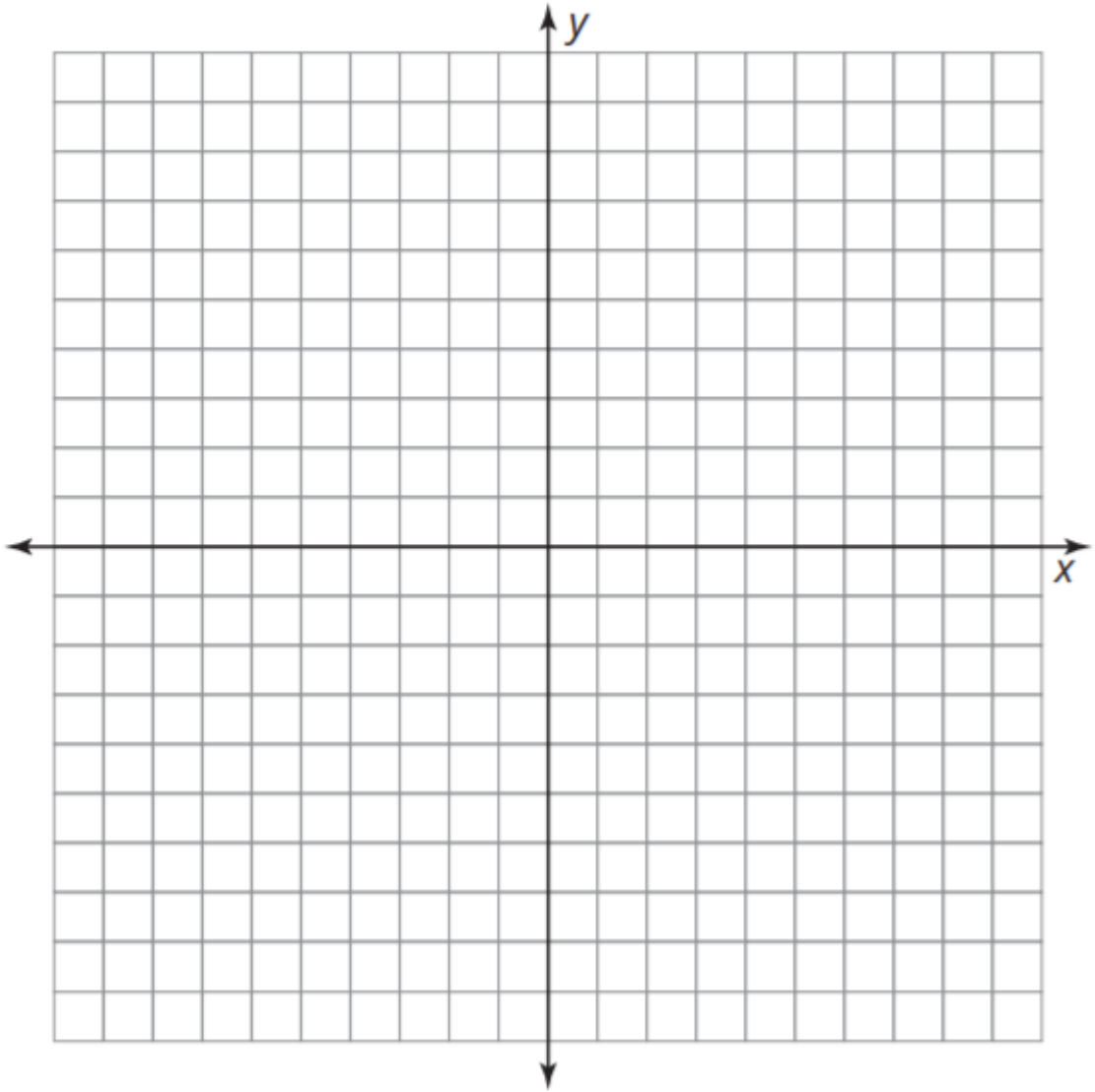
f. $|0 \cdot 4|$

g. $\left|\frac{12}{-3}\right|$

h. $|8 \div (-4)|$

1. Record the coordinates of the plotted points for $f(x) = x$ in the table.

x	y	
	$f(x) = x$	$f(x) = \|x\|$
−9		
−6		
−4		
−1		
0		
3		
5		
8		



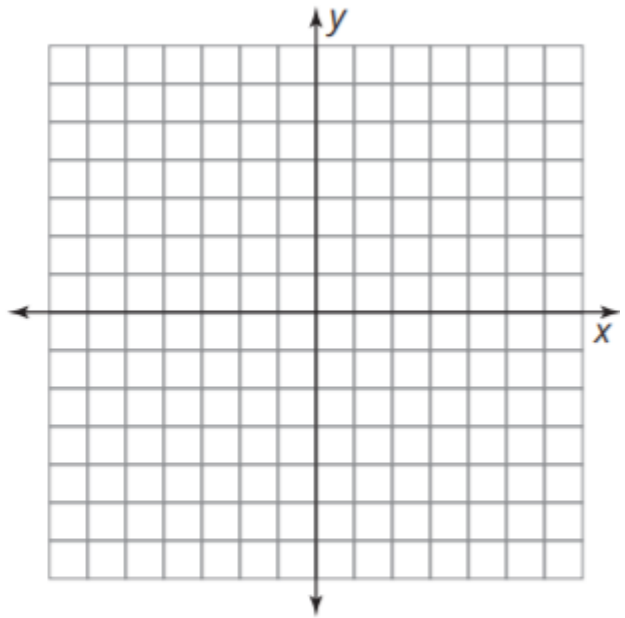
2. **Change all the plotted points to model the function $f(x) = |x|$. In the table, record the coordinates of the new points for $f(x) = |x|$.**

3. **Describe how the points move from the graph of $f(x) = x$ to the graph of $f(x) = |x|$.**

4. **Graph the function $f(x) = |x|$. Describe the characteristics of the function that you notice.**

$g(x) = |x|$ $c(x) = |x| + 3$ $d(x) = |x| - 3$

1. Use technology to graph each function. Then, sketch and label the graph of each function.



2. Write the functions $c(x)$ and $d(x)$ in terms of the basic function $g(x)$. Then describe the transformations of each function.