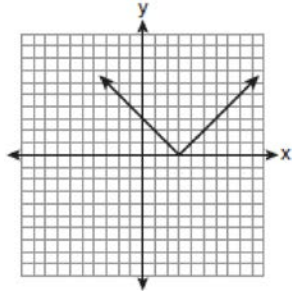
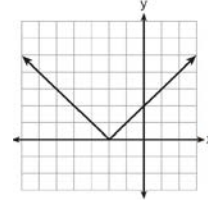


**F.BF.B.3: Graphing Absolute Value Functions**

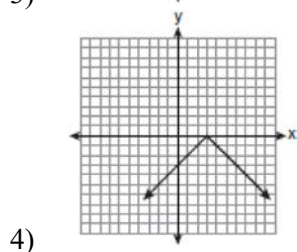
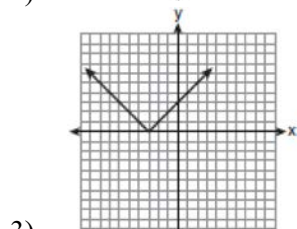
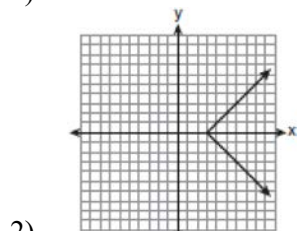
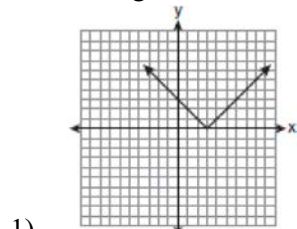
1 The diagram below shows the graph of  $y = |x - 3|$ .



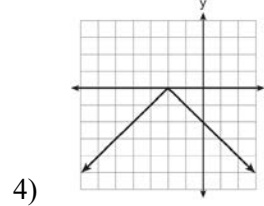
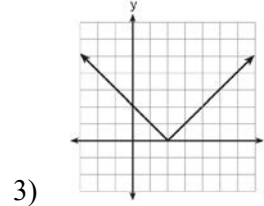
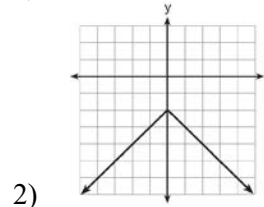
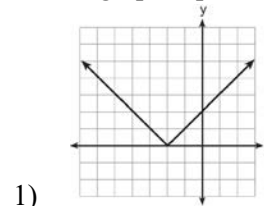
2 The graph of  $y = |x + 2|$  is shown below.



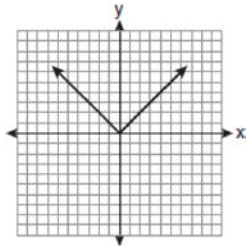
Which diagram shows the graph of  $y = -|x - 3|$ ?



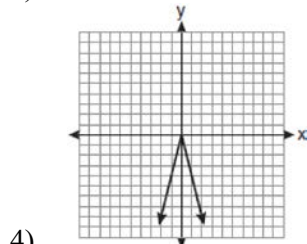
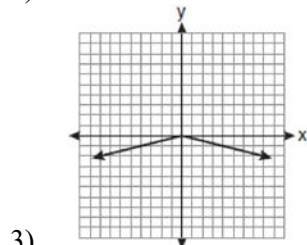
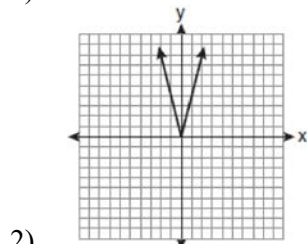
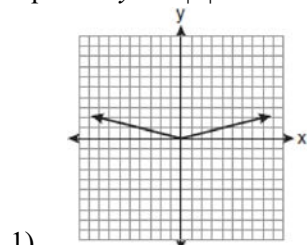
Which graph represents  $y = -|x + 2|$ ?



- 3 The graph of the equation  $y = |x|$  is shown in the diagram below.



Which diagram could represent a graph of the equation  $y = a|x|$  when  $-1 < a < 0$ ?



- 4 Dominick graphs the equation  $y = a|x|$  where  $a$  is a positive integer. If Gina multiplies  $a$  by  $-3$ , the new graph will become

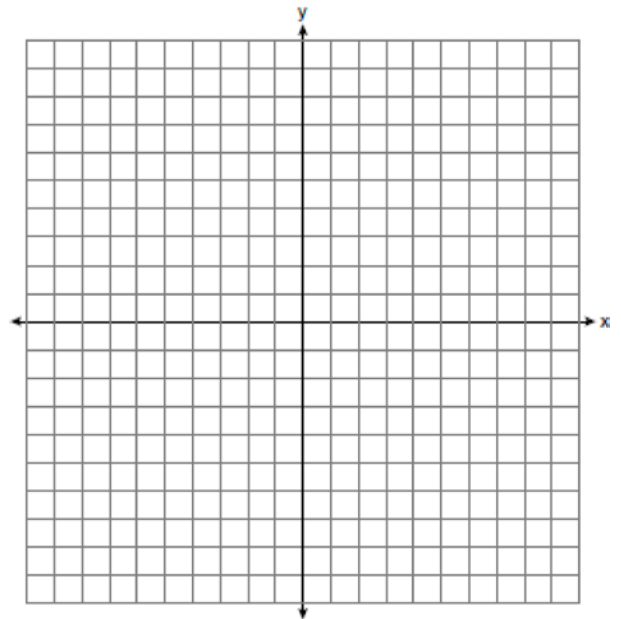
- 1) narrower and open downward
- 2) narrower and open upward
- 3) wider and open downward
- 4) wider and open upward

- 5 Describe the effect that each transformation below has on the function  $f(x) = |x|$ , where  $a > 0$ .

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

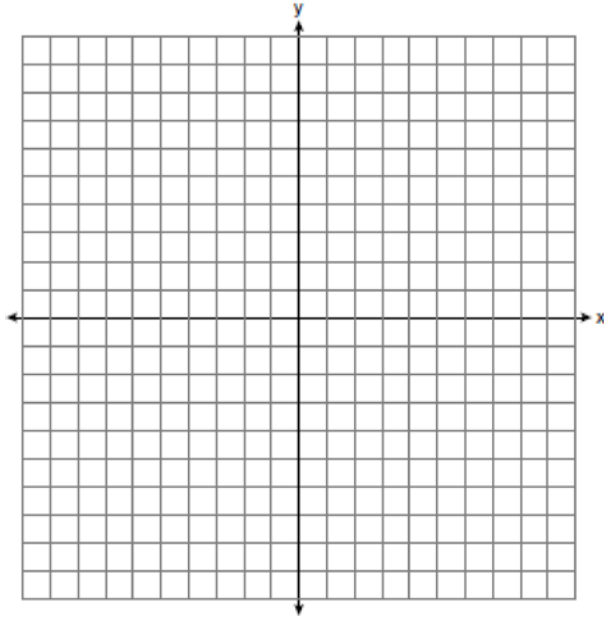
$$h(x) = |x| - a$$

- 6 Graph and label the functions  $y = |x|$  and  $y = |2x|$  on the set of axes below.



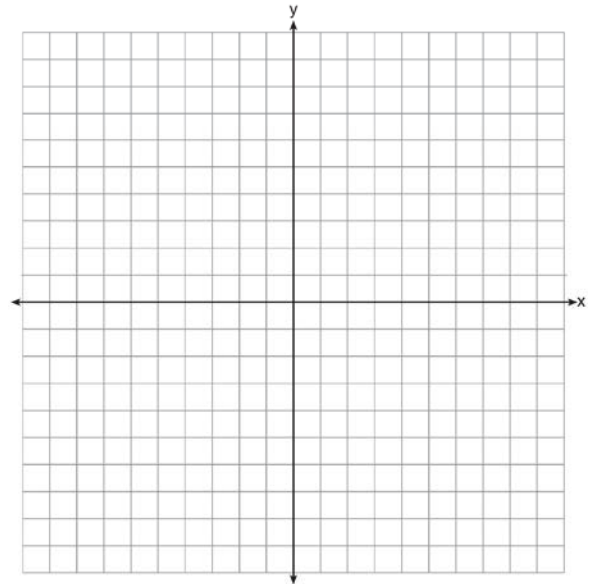
Explain how increasing the coefficient of  $x$  affects the graph of  $y = |x|$ .

- 7 On the set of axes below, graph and label the equations  $y = |x|$  and  $y = 3|x|$  for the interval  $-3 \leq x \leq 3$ .



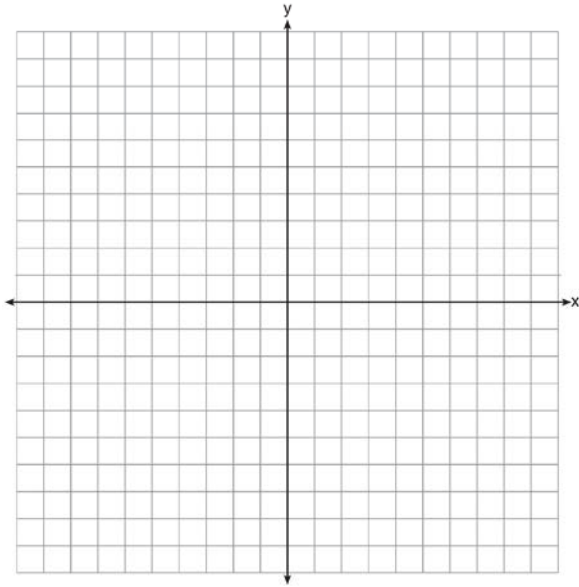
Explain how changing the coefficient of the absolute value from 1 to 3 affects the graph.

- 8 Graph the function  $y = |x - 3|$  on the set of axes below.



Explain how the graph of  $y = |x - 3|$  has changed from the related graph  $y = |x|$ .

- 9 On the axes below, graph  $f(x) = |3x|$ .



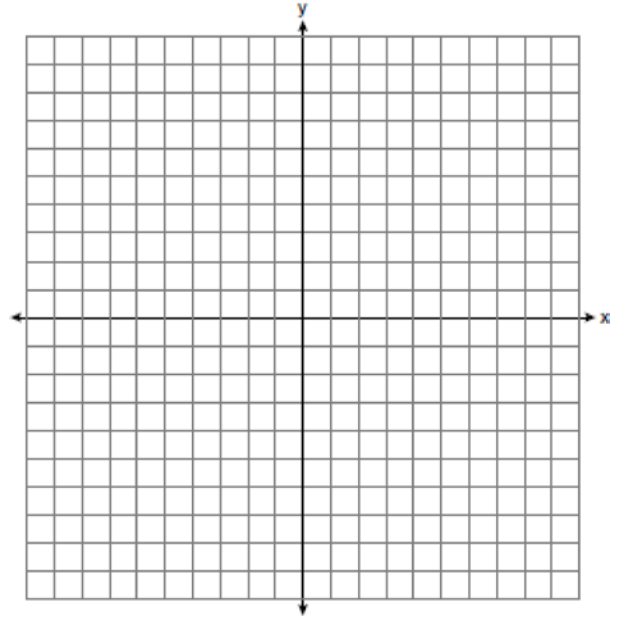
If  $g(x) = f(x) - 2$ , how is the graph of  $f(x)$  translated to form the graph of  $g(x)$ ? If  $h(x) = f(x - 4)$ , how is the graph of  $f(x)$  translated to form the graph of  $h(x)$ ?

- 10 Graph and label the following equations on the set of axes below.

$$y = |x|$$

$$y = \left| \frac{1}{2}x \right|$$

Explain how *decreasing* the coefficient of  $x$  affects the graph of the equation  $y = |x|$ .



### F.BF.B.3: Graphing Absolute Value Functions Answer Section

1 ANS: 4

The transformation is a reflection in the  $x$ -axis.

REF: fall0722ia

2 ANS: 4

The transformation is a reflection in the  $x$ -axis.

REF: 011206ia

3 ANS: 3

REF: 011017ia

4 ANS: 1

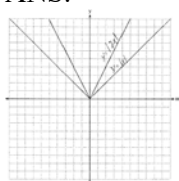
REF: 011529ia

5 ANS:

$g(x)$  is  $f(x)$  shifted right by  $a$ ,  $h(x)$  is  $f(x)$  shifted down by  $a$ .

REF: 061732ai

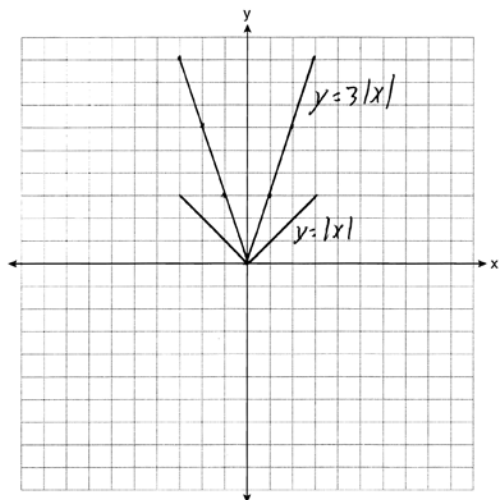
6 ANS:



. Graph becomes narrower as the coefficient increases.

REF: 011434ia

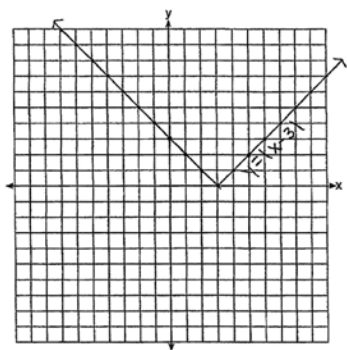
7 ANS:



The graph becomes steeper.

REF: 081134ia

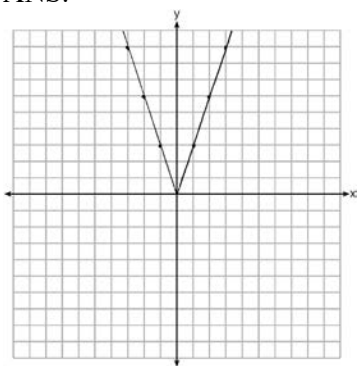
8 ANS:



The graph has shifted three units to the right.

REF: 061525ai

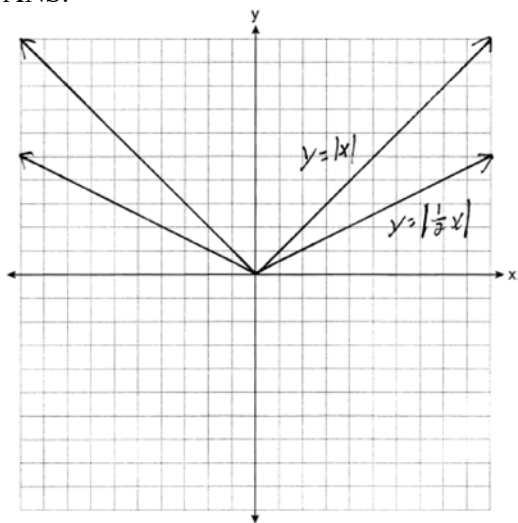
9 ANS:



2 down. 4 right.

REF: 081433ai

10 ANS:



. Graph becomes wider as the coefficient approaches 0.

REF: 061035ia