

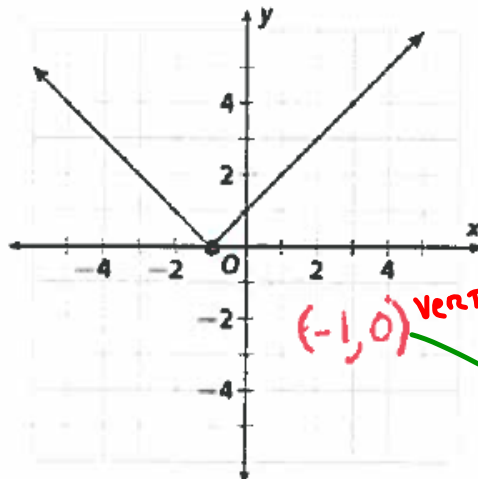
$$\begin{aligned} &|-3| - 5 \\ &3 - 5 \\ &-2 \end{aligned}$$

1. What is $f(x) = |x| - 5$ evaluated for $x = -3$?

- A -8
- C -2**
- B 2
- D 8

NORMAL FLOAT AUTO REAL RADIAN MP 0
1 -31-5-2

Use the graph below for 2-3.



$$g(x) = A|x-h| + K$$

↔
vertex
(h, K)

(-1, 0) vertex

2. Which function matches the graph?

- A** $h(x) = |x+1| + 0$ (-1, 0)
- B $h(x) = |x-1|$ (1, 0)
- C $h(x) = |x|-1$ (0, -1)
- D $h(x) = |x| + 1$ (0, 1)

The vertex in the graph is (-1, 0). Each multiple choice option has its vertex listed in purple. Choice A matches.

3. What is the vertex of the graph?

A $(-1, 0)$

B $(0, -1)$

C $(0, 0)$

D $(1, 1)$

4. Which function has a vertex at $(2, -5)$?

A $y = |x - 2| + 5$ $(2, 5)$

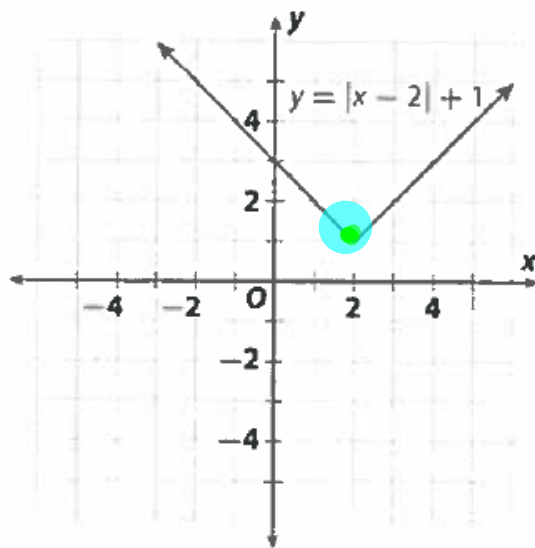
B $y = -5|x - 2|$ $(2, 0)$

C $y = |x - 2| - 5$ $(2, -5)$

D $y = |x + 2| - 5$ $(-2, -5)$

Again, each vertex listed in purple after each multiple choice option. C matches.

5. What is the domain and range of the graph shown below?



$$D: (-\infty, \infty)$$

- A Domain: All real numbers ✓
Range: $y > 1$
- B ~~Domain: $x \geq 1$~~
Range: All real numbers
- C Domain: All real numbers ✓
Range: $y \geq 1$
- D ~~Domain: $x > 1$~~
Range: All real numbers

The domain of every absolute valley question will always be $(-\infty, \infty)$, or All Real Numbers.

For Range go from bottom of the graph to top. In this case, as low as one and up to infinity. Include the value of one. correct answer is C

6. If $f(x) = |x|$, write a function $g(x)$ that is $f(x)$ translated **up 4 units**

$$g(x) = |x| + 4$$

7. What are the solutions to $4|x+8| = 4$?

A $-9, 7$

B $-8, 8$

C $-1, 4$

D $-8, 4$

$$\frac{4|x+8|}{4} = \frac{4}{4}$$

$$|x+8| = 1$$

$$\begin{array}{l} \swarrow \quad \searrow \\ x+8=1 \quad x+8=-1 \\ x=-7 \quad x=-9 \end{array}$$

8. For which value of k does the equation $|14+x| - 5 = k$ have **one real solution**?

A -14

B -5

C 0

D 5

$$|14+x| = k+5$$

MUST BE ZERO FOR ONE SOLUTION

$$k+5=0$$

$$k=-5$$

For 9–12, use the absolute value function

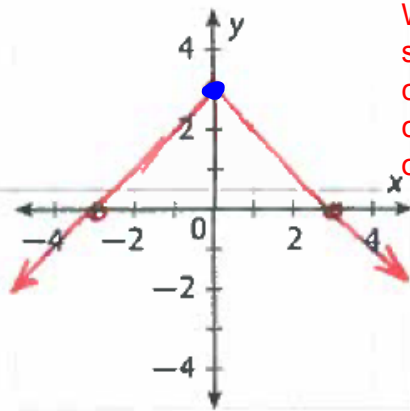
$$f(x) = -|x| + 3. \quad V: (0, 3)$$

9. Graph the function.

$$(x, -y+3)$$

$$(-3, 3) \rightarrow (-3, 0)$$

$$(3, 3) \rightarrow (3, 0)$$



When graphing an absolute value, start with finding the vertex. Next create a rule for both X and Y. Then chose some coordinates on your own and plug them in to your rule.

10. Find the vertex of the function.

$$(0, 3)$$

11. Find the domain of the function.

$$(-\infty, \infty)$$

12. Find the range of the function.

$$(-\infty, 3]$$

Range is bottom to top

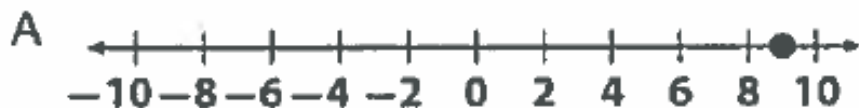
13. Does each number line show a solution to $-2|x-7| = -4$?

Handwritten work:

$-2|9-7|$
 $-2|2|$
 -4 →

$-2|2-7|$
 $-2(5)$
 -10 →

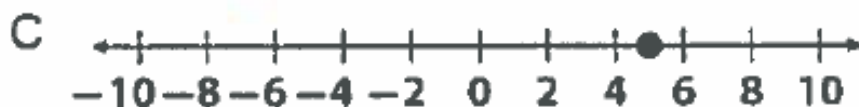
$-2|5-7|$
 $-2(2)$
 -4 →



Yes No



Yes No



Yes No

NORMAL FLOAT AUTO REAL RADIAN MP	
-2 9-7	✓ -4
-2 2-7	✗ -18
-2 5-7	✓ -4

For 14–15, solve the absolute value equation or inequality graphically.

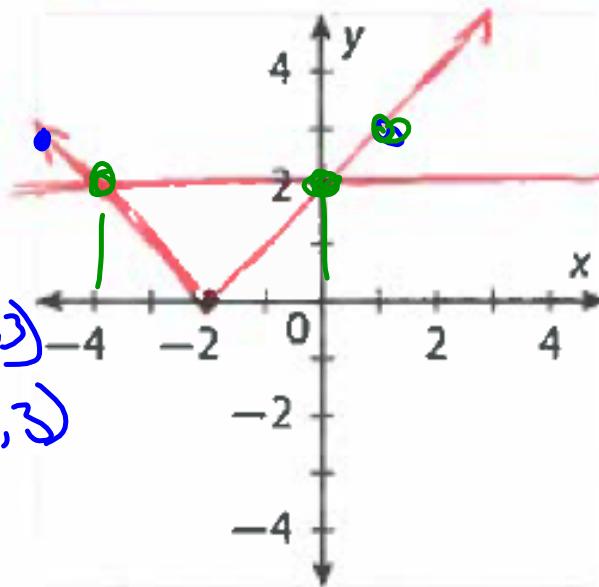
14. $|x+2|=2$

$V: (-2, 0)$

$(x-2, y)$

$(-3, 3) \rightarrow (-5, 3)$

$(3, 3) \rightarrow (1, 3)$



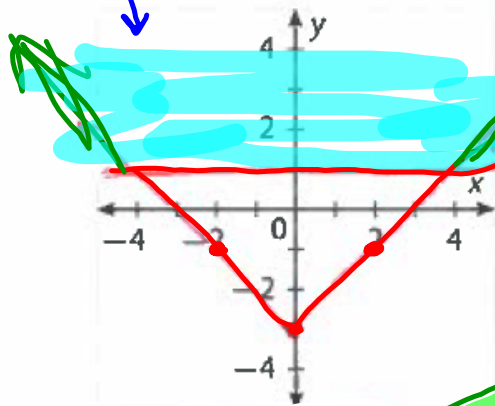
The points at $(-4, 2)$ and $(0, 2)$ are the intersection of the absolute value function, and the horizontal line at 2.

The answer $x = -4$, $x = 0$ shows the location of these intersections.

$x = -4$ $x = 0$

15. $|x-3| > 1$

After drawing this graph, notice the absolute value graph is above the horizontal line to the left of $x=-4$ and to the right of $x=4$. Because the solution is in two place this is an "or" problem.



$V: (0, -3)$

$(x, y-3)$

$(-2, 2) \rightarrow (-2, -1)$

$(2, 2) \rightarrow (2, -1)$

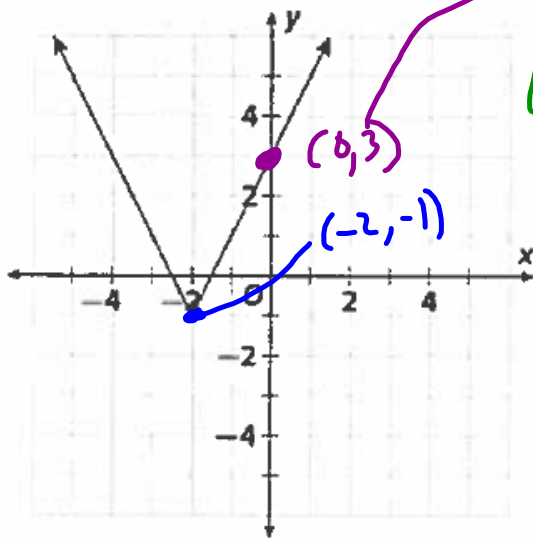
$x < -4$ OR $x > 4$

16. Is each value of x a solution of $8 \leq |6 - 2x| - 12$?

- | | | |
|------|--------------------------------------|-------------------------------------|
| A -9 | <input checked="" type="radio"/> Yes | <input type="radio"/> No |
| B -6 | <input type="radio"/> Yes | <input checked="" type="radio"/> No |
| C 10 | <input type="radio"/> Yes | <input checked="" type="radio"/> No |
| D 13 | <input checked="" type="radio"/> Yes | <input type="radio"/> No |

NORMAL	FLOAT	AUTO	REAL	RADIAN	MP	
						12
$16 - 2(-9) - 12$						6
$16 - 2(-6) - 12$						2
$16 - 2(10) - 12$						8
$16 - 2(13) - 12$						

Use the graph below for 17–20.



$$g(x) = A|x-h| + K$$

$$3 = A|0+2| - 1$$

$$3 = A|2| - 1$$

$$4 = A(2)$$

$$2 = A$$

17. Write a function in standard form to match the graph. Let $b = 1$.

$$y(x) = 2|x+2| - 1$$

18. Find the vertex of the function.

$$(-2, -1)$$

19. Find the domain of the function.

$$(-\infty, \infty) \quad \mathbb{R}$$

20. Find the range of the function.

$$[-1, \infty)$$

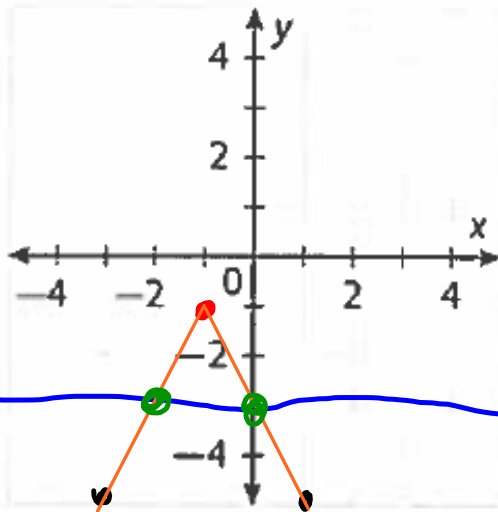
For 21-22, solve the absolute equation or inequality graphically.

21. $-3 = -2|x+1| - 1$

$$(x-1, -2y-1)$$

$$(-2, 2) \rightarrow (-3, -5)$$

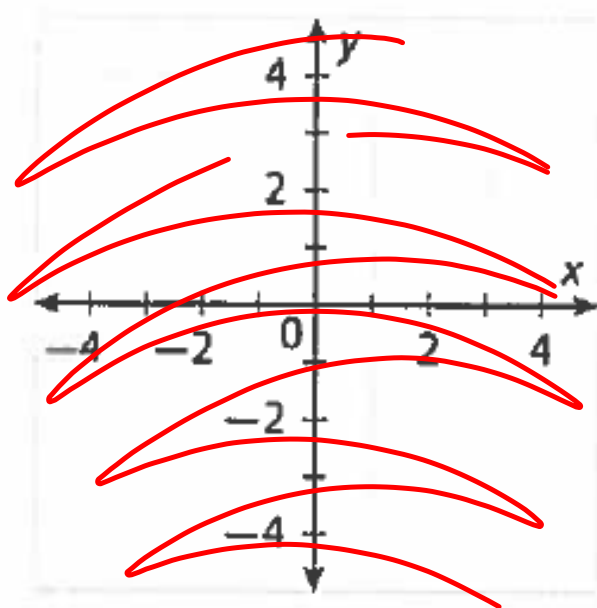
$$(2, 2) \rightarrow (1, -5)$$



$$x = -2, 0$$

$$22. 2 + |x+1| \leq 4 \rightarrow \underline{|x+1| + 2 \leq 4}$$

Solve by Algebra



$$|x+1| \leq 2$$

$$\begin{array}{c} -2 \leq x+1 \leq 2 \\ -1 \quad -1 \quad -1 \end{array}$$

$$\boxed{-3 \leq x \leq 1}$$