

13.2

13.2 Absolute Value Functions and Transformations

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Identify the values of h , k , and a given in each absolute value function. Remember, an absolute value function is written in the form $f(x) = a|x - h| + k$.

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

$$h = \boxed{3}, k = \boxed{3}, a = \boxed{4}$$

$$f(x) = -0.3|x - 2| + 5$$

$$h = 2, k = \boxed{5}, a = \boxed{-0.3}$$

$$f(x) = -6|x + 5| - 3$$

$$h = \boxed{-5}, k = \boxed{-3}, a = -6$$

$$f(x) = 0.5|x + 2| - 9$$

$$h = -2, k = -9, a = \boxed{0.5}$$

$$f(x) = 0.7|x| + 2$$

$$h = \boxed{0}, k = 2, a = \boxed{0.7}$$

Determine the domain and range of the function.

$$g(x) = |x + 1| + 3$$

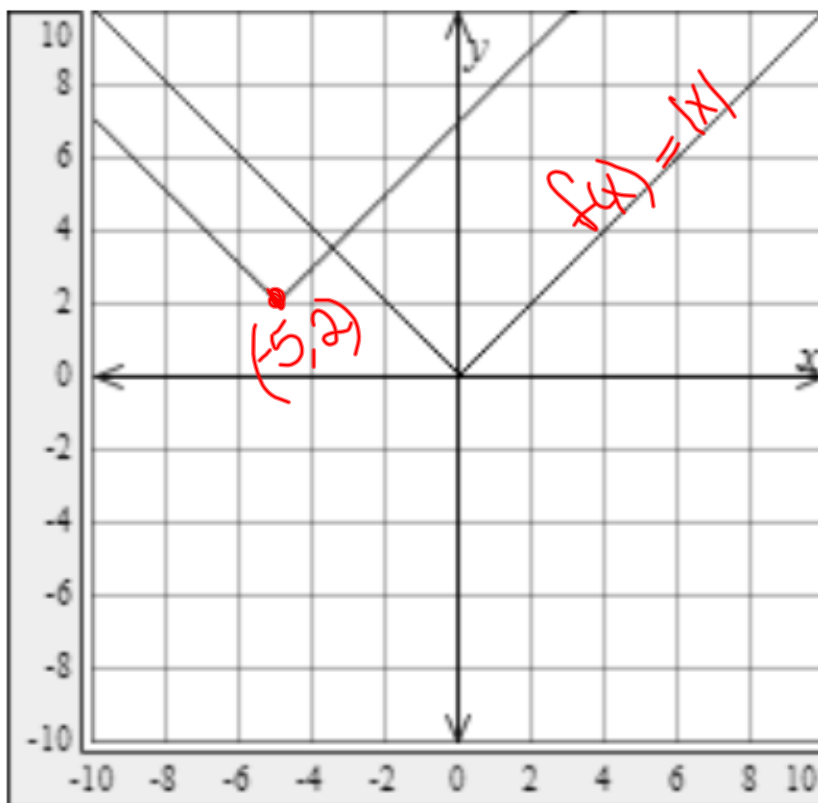
Range Value (k)

The domain is .

The range is $\left\{ y \mid \text{} \right\}$. If slope (a) is positive, the \geq
If slope (a) is negative, the \leq

$$g(x) = |x + 5| + 2$$

(h, k)



Given $g(x) = -\frac{1}{5}|x + 3| + 6$, find the vertex and two other points on the graph of $g(x)$ and use them to help you select the graph of $g(x)$.

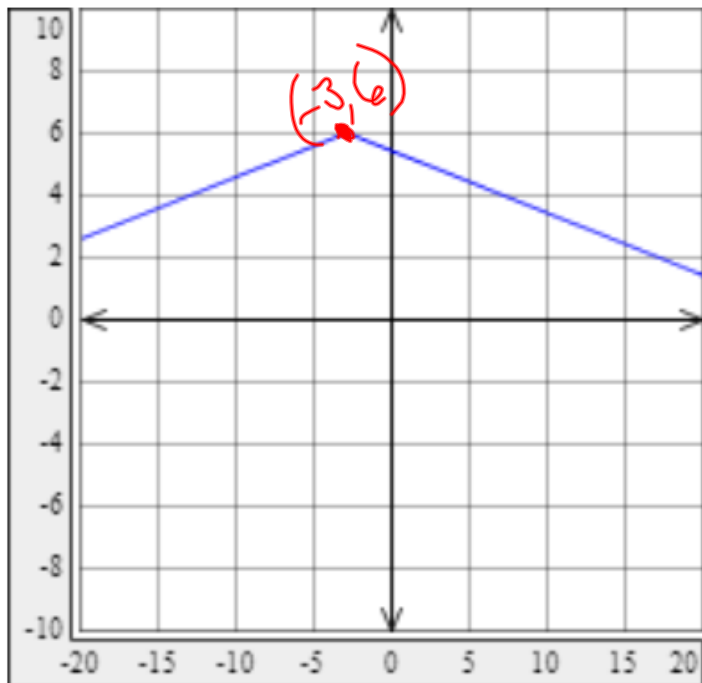
The vertex is located at $(-3, 6)$.

Two other points are $(7, 4)$ and $(-13, 4)$.

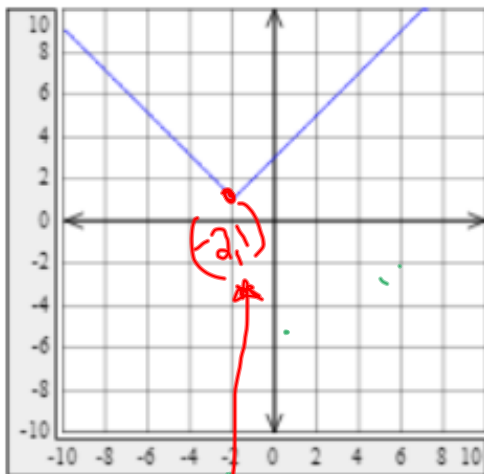
$$g(x) = -\frac{1}{5}|x + 3| + 6$$

absolute value of 10 is 10

$$= -\frac{1}{5}|7 + 3| + 6 = -\frac{1}{5}|10| + 6 = -\frac{10}{5} + 6 = -2 + 6 = 4$$



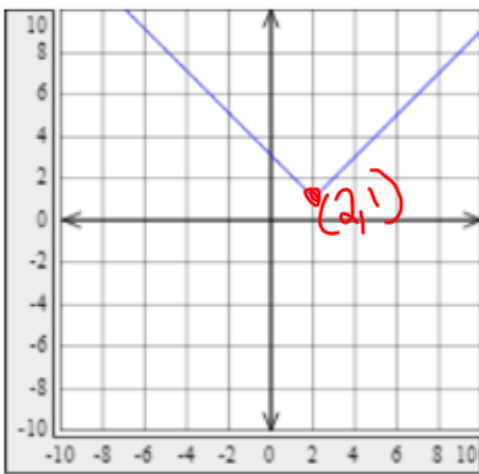
Drag and drop each function next to its corresponding graph.



$$y = |x + 2| + 1$$

h-opposite
sign

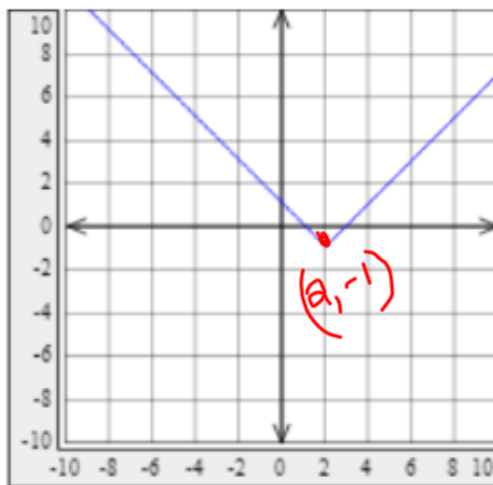
vertex, (h, k) .



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



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



$$y = |x - 2| - 1$$

Given the graph of the absolute value function below, write the function in the form

$$g(x) = \left| \frac{1}{b} (x - h) \right| + k.$$

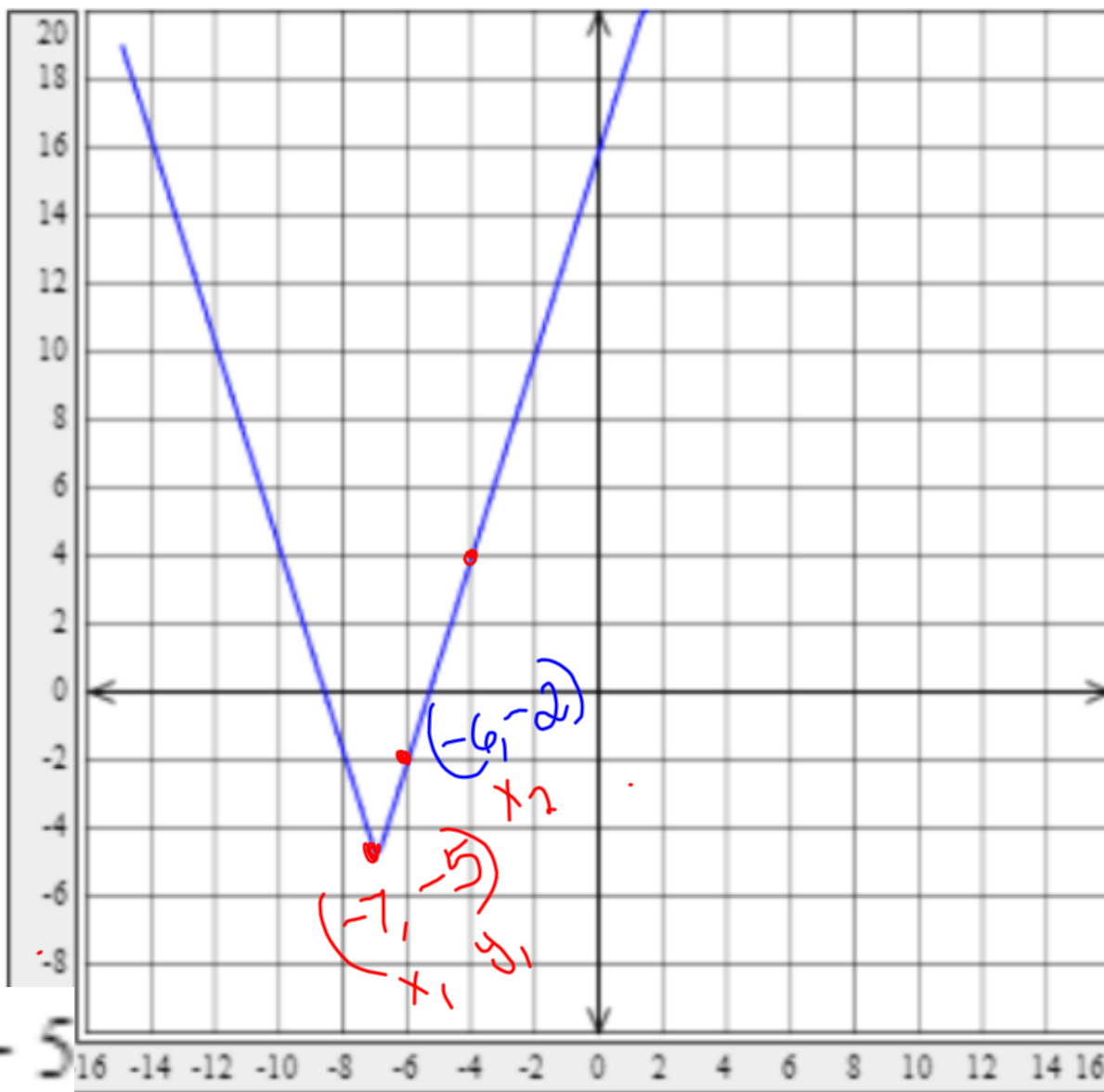
$$(h, k) = (-7, -5)$$

$$\text{Slope}(a) = \frac{y_2 - y_1}{x_2 - x_1}$$

$$a = \frac{-2 + 5}{-6 + 7}$$

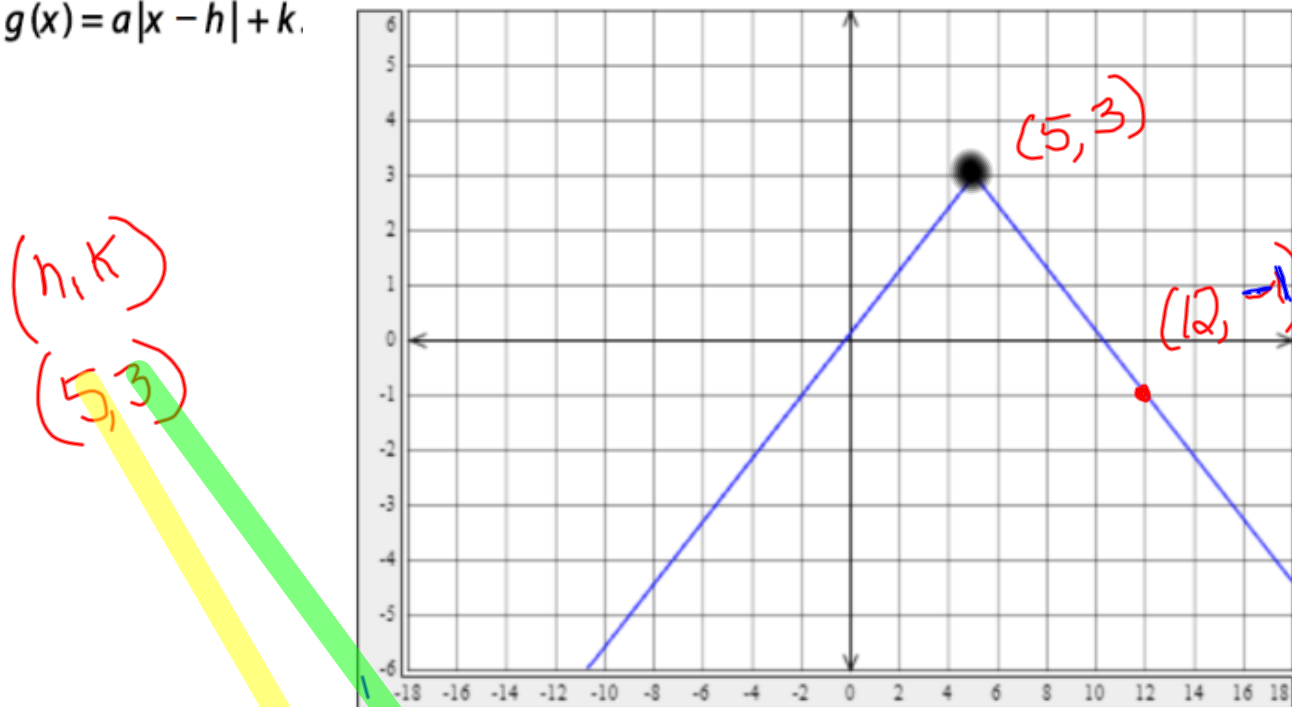
$$a = \frac{3}{1} = 3$$

$$g(x) = |3(x + 7)| - 5$$



Given the graph of the absolute value function below, enter the function in the form

$$g(x) = a|x - h| + k.$$



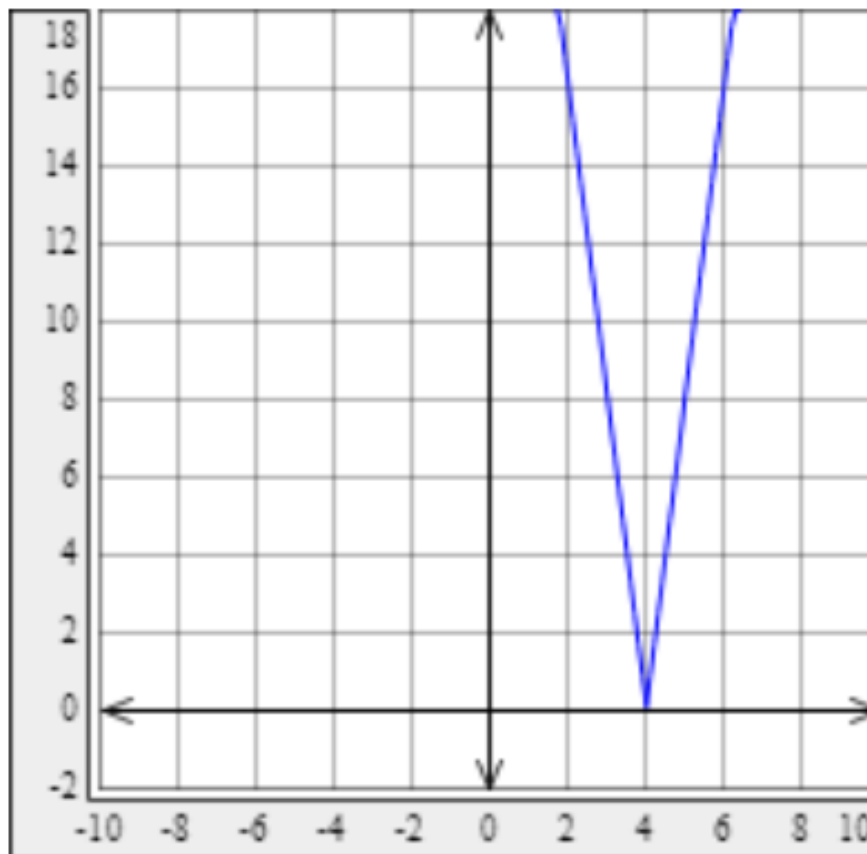
$$\text{Slope } (a) = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 + 1}{5 - 12} = \frac{4}{-7}$$

$$-\frac{4}{7}|x - 5| + 3$$

Predict what the graph of the function $g(x) = 8|x - 4|$ will look like then select the graph of the function.

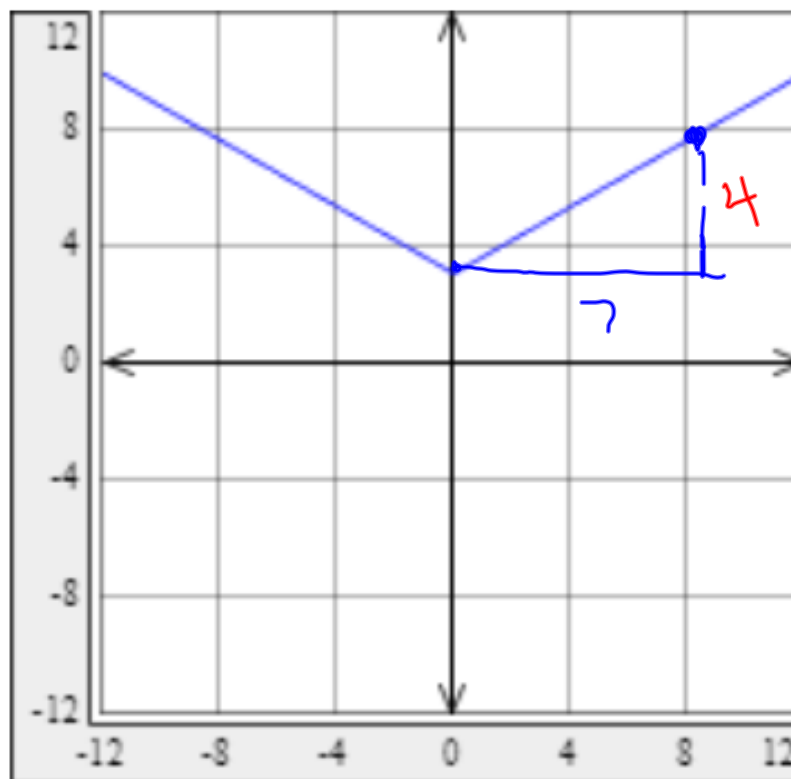
The graph of $g(x) = 8|x - 4|$ is the graph of $f(x) = |x|$ shifted units to the .

The graph is then stretched by a factor of .



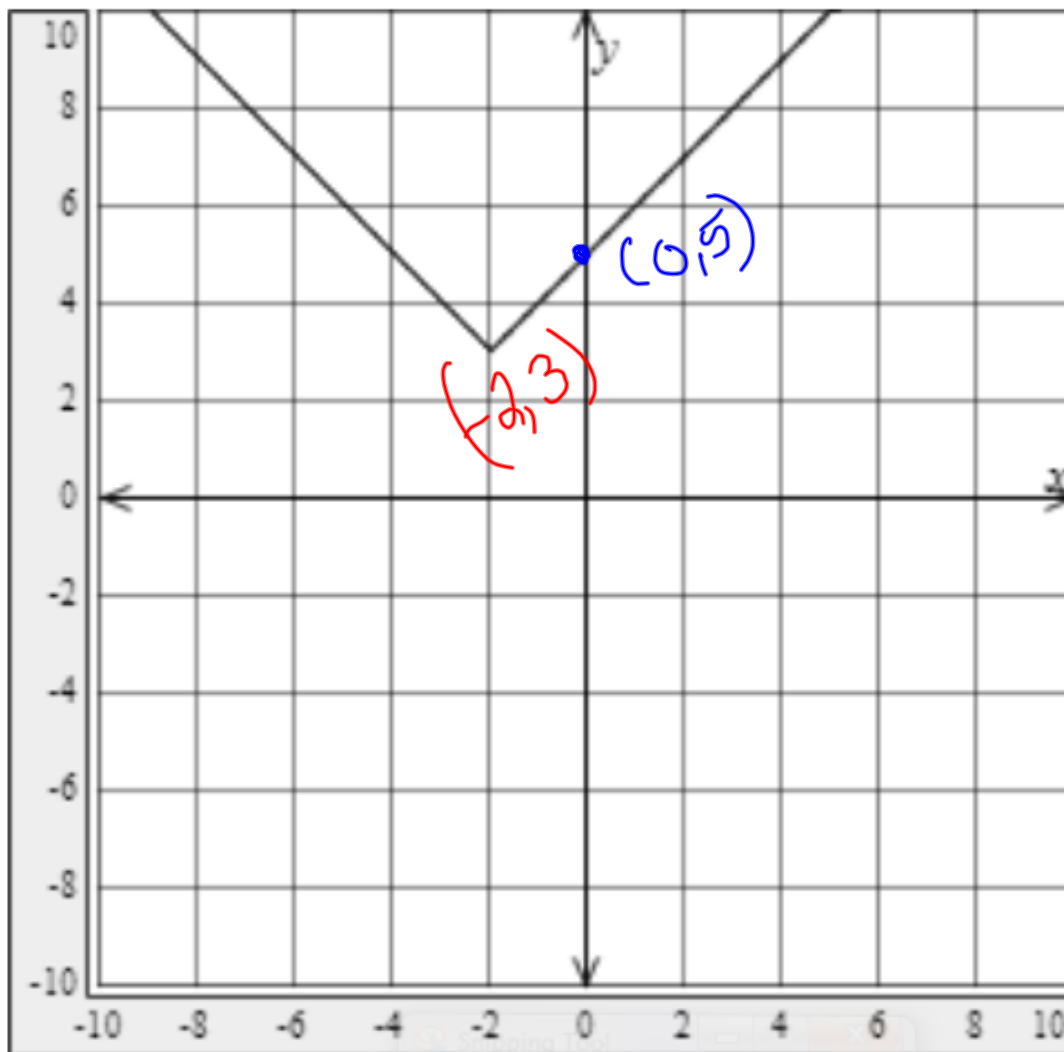
Select the graph of the function $g(x) = \left|\frac{4}{7}x\right| + 3$ and identify the domain and range.

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Vertex (0, 3) Slope = $\frac{4}{7}$ 

D: all real numbers; R: $y \geq 3$

Enter an equation for the absolute value function whose graph is shown.



$$g(x) = a|x - h| + k$$

$$= |x + 2| + 3$$

$\frac{5 - 3}{0 + 2} = \frac{2}{2} = 1$