

Algebra 2

2. Miscellaneous Functions

2.1 Analyzing Graphs of Absolute Value Functions

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Exercises

Find all solutions to exercises via

https://mathleaks.com/study/analyzing_graphs_of_absolute_value_functions

or scan the QR code



- 1.1** Determine the absolute values when $x = 2$.

A $|x + 8|$

B $|-5x + 1|$

C $|(-x)^3|$

- 1.2** Graph the absolute value function $f(x) = |x + 4| - 4$.

- 1.3** Graph $y = |5x|$ by making a table of values.

- 1.4** Graph the absolute value function $f(x) = |x - 4|$.

- 1.5** Solve the equation graphically.

$$|x - 3| + 2 = 5$$

- 1.6** Graph the function $f(x) = -|x + 3| - 2$.

- 1.7** Graph the absolute value function $f(x) = -\frac{3}{5}|x|$.

- 1.8** Solve the equation graphically.

$$\left| \frac{5}{2}(x - 2) \right| + 4 = 1$$

- 1.9** Consider the function $f(x) = |3x| + 2$.

- A** Make a table of values where x is all integers from -4 to 4, inclusive.
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- B** Plot the points on a coordinate plane.
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- C** Graph the function.

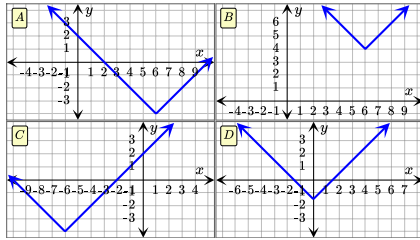
1.10 Graph the function

$$f(x) = -\frac{3}{4}|x + 4| - 2$$

1.11 Graph the function

$$f(x) = \frac{4}{3}|(x - 5)| + 7.$$

1.12



Pair the function with its corresponding graph.

A $y = |x + 6| - 4$

B $y = |x - 6| - 4$

C $y = |x - 6| + 4$

1.13 Graph the function

$$f(x) = \left| \frac{3}{4}(x - 2) \right| - 7.$$

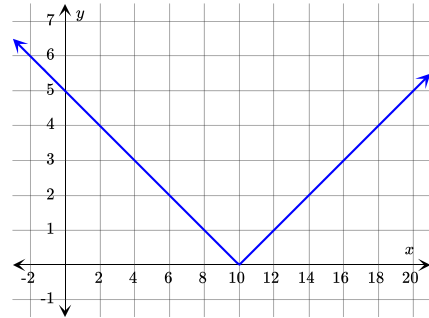
1.14 Solve the equation graphically.

$$2|x + 1| + 6 = 8$$

1.15 Solve the equation graphically.

$$-2|x + 5| + 4 = 2$$

2.1 Find a function rule for the absolute value function graphed in the diagram.

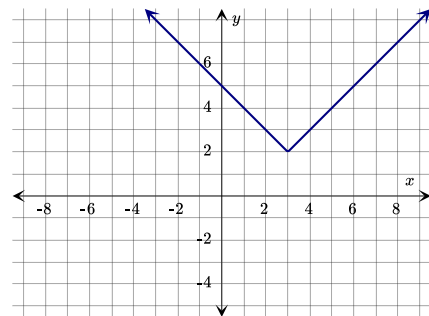


2.2 Graph $y = 2|x + 1| - 5$ and $y = -1$ in the same coordinate plane. Use the graph to solve the equation $2|x + 1| - 5 = -1$.

2.3 Give an example of an absolute value function $g(x)$ that satisfies

$$g(5) = -2.$$

2.4 Ron-Jon attempt to draw the graph of $y = |x + 3| + 2$ failed.



Explain what went wrong and write the equation of the graph.

2.5 Draw a circle with the midpoint at $(4, 0)$ and a radius of 6. Use an absolute value equation to find two points in the circle where the distance between them is the diameter.

2.6 The height limit for a roller coaster is 60 cm.

A Write an absolute value function for the difference between a person's height h and the height limit.

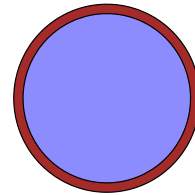
B What is an appropriate domain for the function? Explain your reasoning.

C Use the domain to graph the function.

3.1 The depth of a pond can be found with the function:

$$d = \left| \frac{|e - 24|}{5} - 4.8 \right|,$$

where e is the distance from the pond's edge.



Your dog runs into the water. How far can he run before it is too deep if his height is 3 feet?

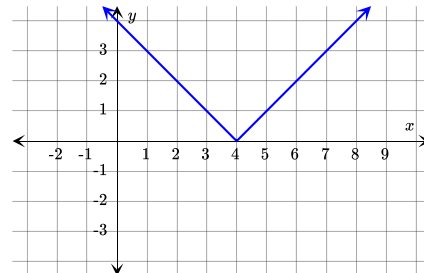
3.2 Graph the functions

$$g(x) = \frac{1}{2}|x|, g(x) = \left| \frac{1}{2}x \right|,$$

$$g(x) = -\frac{1}{2}|x|, \text{ and}$$

$g(x) = \left| -\frac{1}{2}x \right|$, from $x = -6$ to $x = 6$, and then compare the graphs.

3.3 In the diagram is the graph of the function $y = |g(x)|$.



Find $g(x)$.

