

WARM UP

Solve the following for x .

$$3|x - 4| + 9 = 6$$

$$-2|2x + 5| + 10 = 2$$

$$|2x + 6| = |x|$$

ESSENTIAL QUESTION

What are the key features of the graph of the absolute value function?

NEEDED VOCAB:

- ▶ **Absolute Value Function**
- ▶ **Axis of Symmetry**
- ▶ **Vertex**

GOAL: "I CAN..."

Analyze functions that include absolute value expressions."

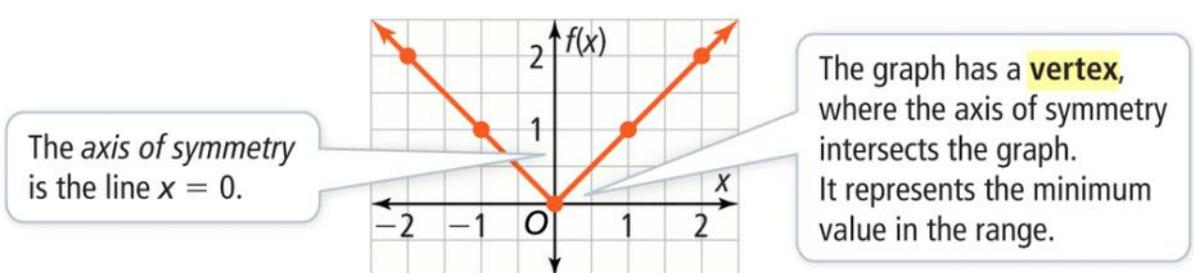
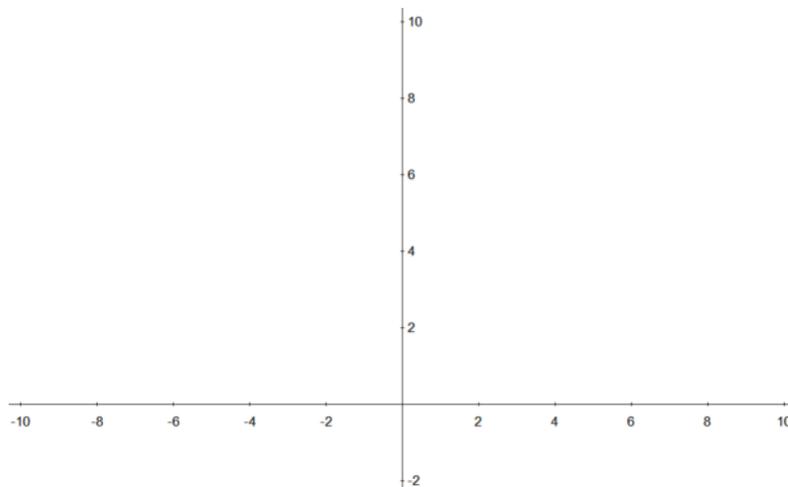
EXAMPLE 1

What are the features of the graph of $f(x) = |x|$?

Make a table of values

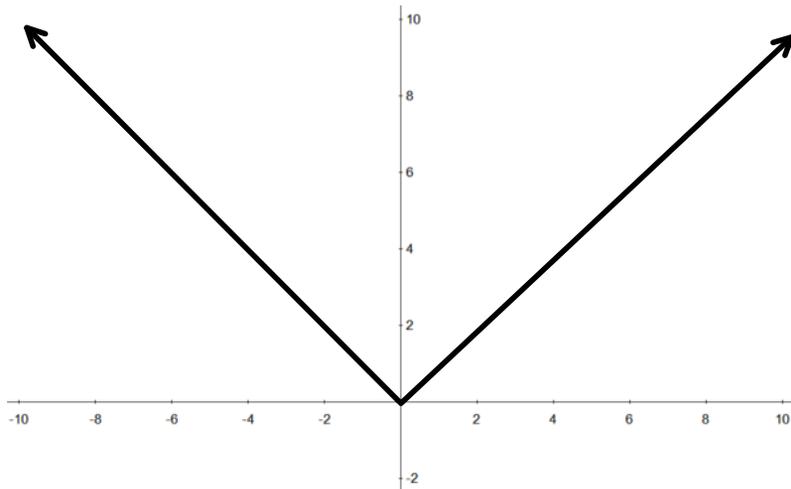
X	Y

What does the graph look like?



The graph has an **axis of symmetry**, which intersects the vertex and divides the graph into two sections, or pieces, that are images of each other under a reflection.

What is the domain and range of $f(x) = |x|$?



EXAMPLE 2

How does the Domain and Range of $g(x) = 2|x|$ compare to the Domain and Range of $f(x) = |x|$?

How does the Domain and Range of $h(x) = -1|x|$ compare to the Domain and Range of $f(x) = |x|$?

2. How do the domain and range of each function compare with the domain and range of $f(x) = |x|$?

a. $g(x) = \frac{1}{2}|x|$

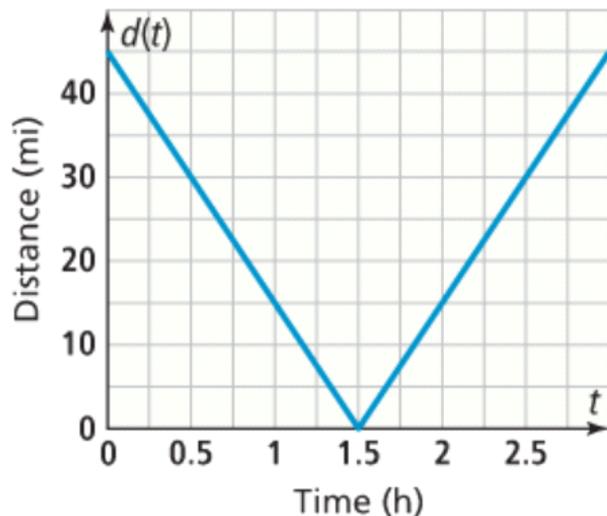
b. $h(x) = -2|x|$

EXAMPLE 3

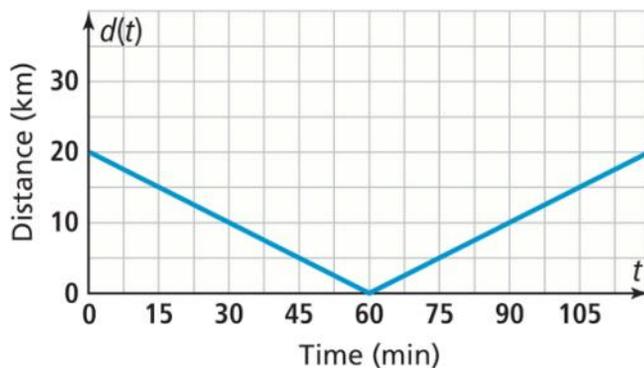
Jay rides in a boat from his home to his friend's home in a neighboring state. The graph of the function $d(t) = 30|t - 1.5|$ shows the distance of the boat in miles from the state line at t hours. Assume the graph shows Jay's entire trip.

A. How far does Jay travel to visit his friend?

B. How does the graph relate to the domain and range of the function?



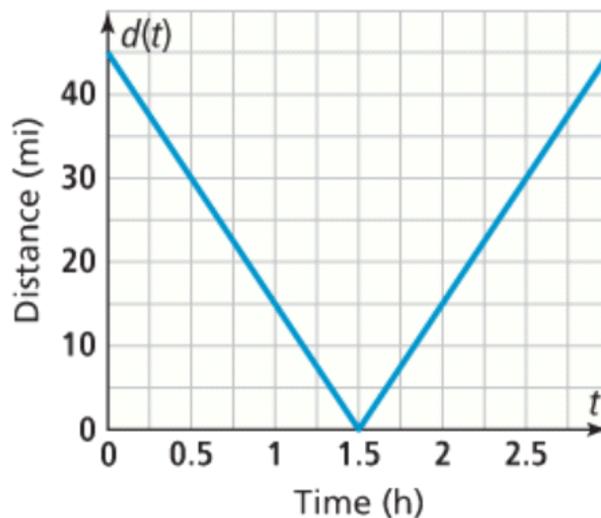
3. A cyclist competing in a race rides past a water station. The graph of the function $d(t) = \frac{1}{3} |t - 60|$ shows her distance from the water station at t minutes. Assume the graph represents the entire race. What does the graph tell you about her race?



EXAMPLE 4

According to the graph what is the rate at which the object is moving?

Does the objects speed change at any point during the trip?



<https://tinyurl.com/rjcmxbj>



HOMWORK

Pg. 188

10-12, 17-25 ODD, 34