

Warm up:

For the equation $f(x) = x^4(x - 3)(x + 1)(x - 7)$, which of these numbers is *not* a root?

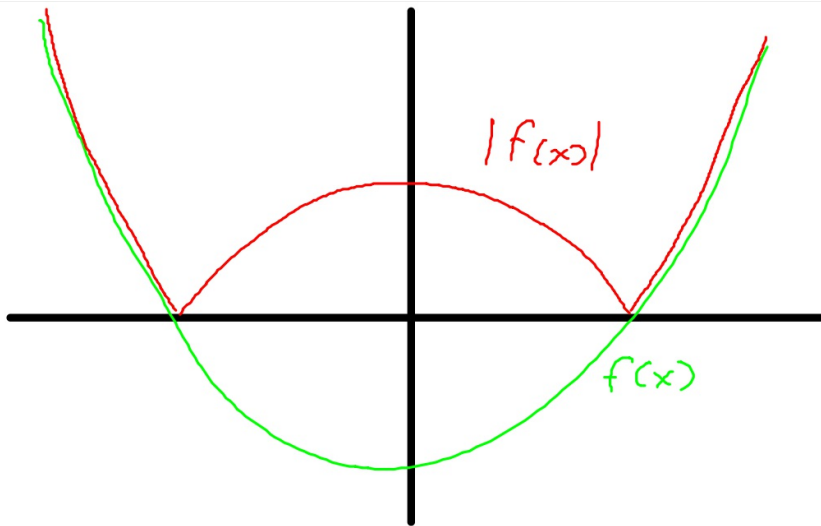
8 0 3 -3 7 1 -1

Obj: SWBAT graph and solve problems with piecewise functions.

Agenda:

- Warm up
- Notes on Piecewise functions
- Practice
- Exit Ticket/reflections

HW: Piecewise functions 1-10



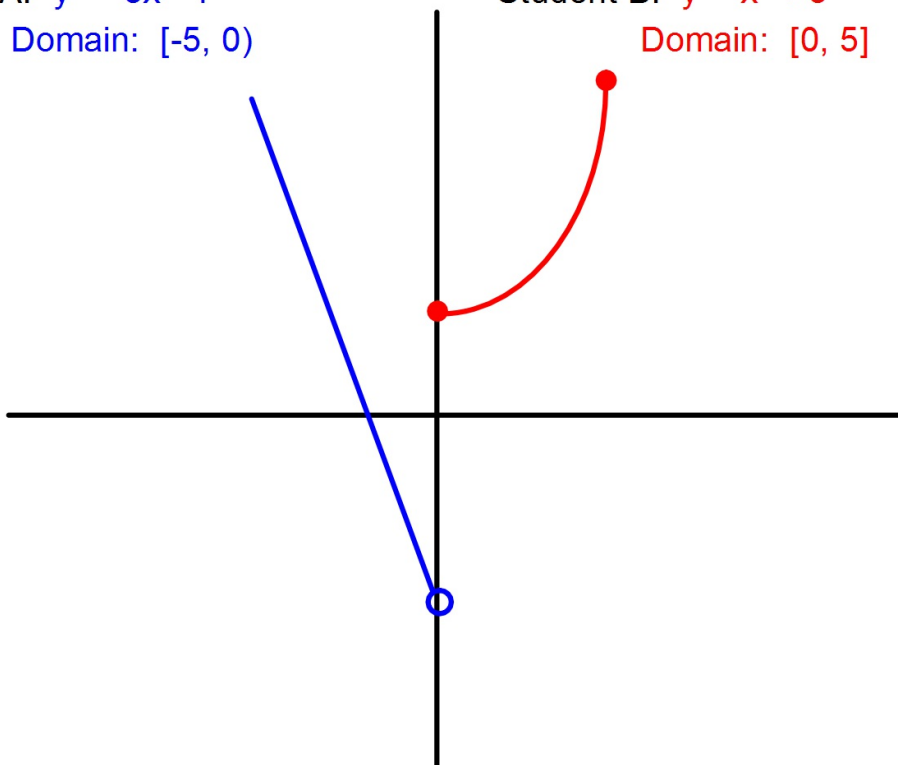
Above is the graph of $y = f(x)$. What would the graph of $y = |f(x)|$ be?

Example:

Piecewise: made of pieces of functions

Student A: $y = -3x - 4$
Domain: $[-5, 0)$

Student B: $y = x^2 + 3$
Domain: $[0, 5]$



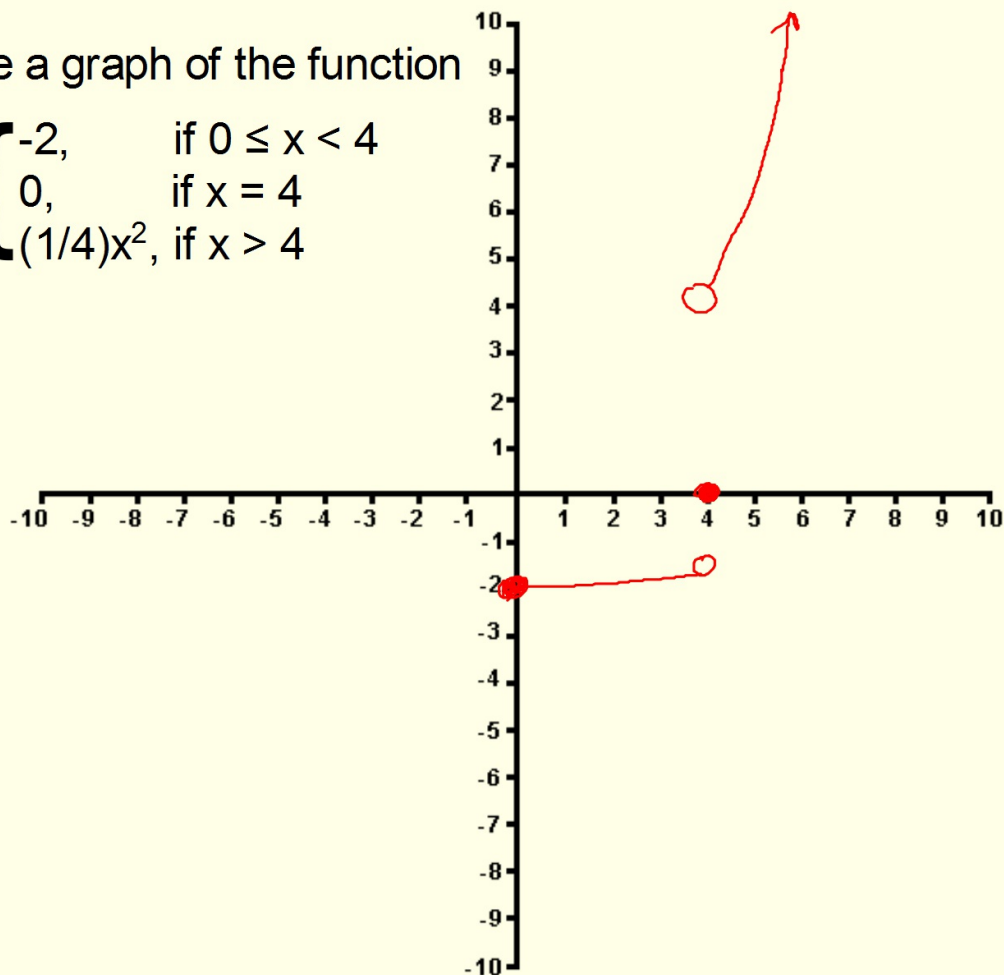
Piecewise function is a function that is defined by two or more expressions on separate parts of the domain.

A piecewise function is written using a large brace. For example, the absolute value function can be written as the piecewise function $y = \begin{cases} x, & \text{if } x \geq 0 \\ -x, & \text{if } x < 0 \end{cases}$. Note that both portions of the function cannot include $x = 0$ in the domain, even though the output is the same for both portions.

To graph a piecewise function, graph each portion of the function on its restricted domain.

Create a graph of the function

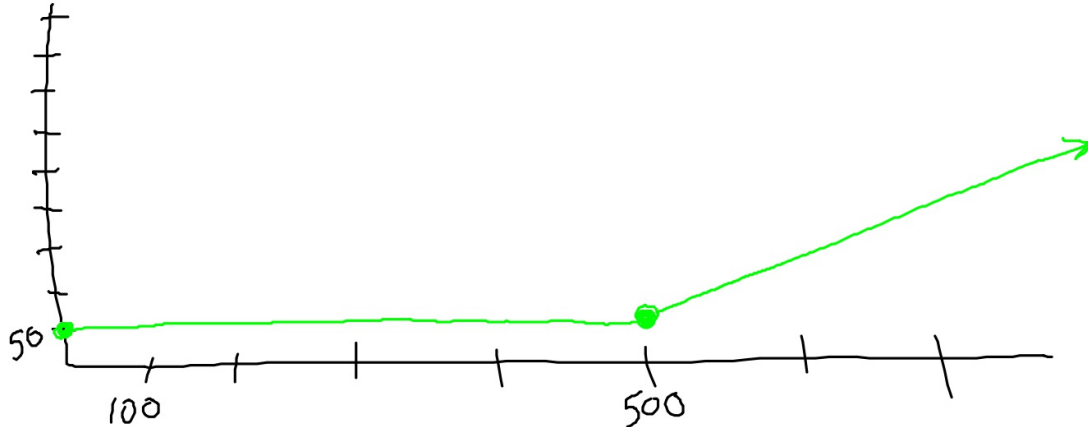
$$y = \begin{cases} -2, & \text{if } 0 \leq x < 4 \\ 0, & \text{if } x = 4 \\ (1/4)x^2, & \text{if } x > 4 \end{cases}$$



A cell-phone plan charges customers a monthly fee, which includes 500 minutes of talk time. After 500 talk minutes, the customer is charged \$0.10 a minute. The total monthly charges, y , for any number of talk minutes, x , can be represented using the piecewise function

$$y = \begin{cases} 50, & \text{if } 0 \leq x \leq 500 \\ 50 + 0.1(x - 500), & \text{if } x > 500 \end{cases}$$

Create a graph to show the monthly charges for any number of talk minutes.



Practice:

practice 2.4.3: piecewise functions (with the pencils)

- use Desmos to graph the functions

Reflection:

What happens when part of the function is just a point?