

Yay! Quiz today!

1) Find the domain algebraically.

$$f(x) = \frac{\sqrt{x+1}}{x-7}$$

$x+1 \geq 0$   
 $x \geq -1$   
 $x-7 \neq 0$   
 $x \neq 7$

$[-1, 7) \cup (7, \infty)$

2) Find the vertex and axis of symmetry algebraically.

$$f(x) = 2x^2 + 4x - 1$$

$(-1, -3)$   
 $x = -1$

$$\frac{-b}{2a} = \frac{-4}{2(2)} = \frac{-4}{4} = -1$$

$$f(-1) = 2(-1)^2 + 4(-1) - 1$$

$$= 2 - 4 - 1$$

$$= -3$$

$2(x^2 + 2x) - 1$   
 $2(x^2 + 2x + 1) - 1 - 2$   
 $2(x+1)^2 - 3$   
 $(-1, -3)$  a.o.s.  
 $x = -1$

## Piecewise and Step Functions

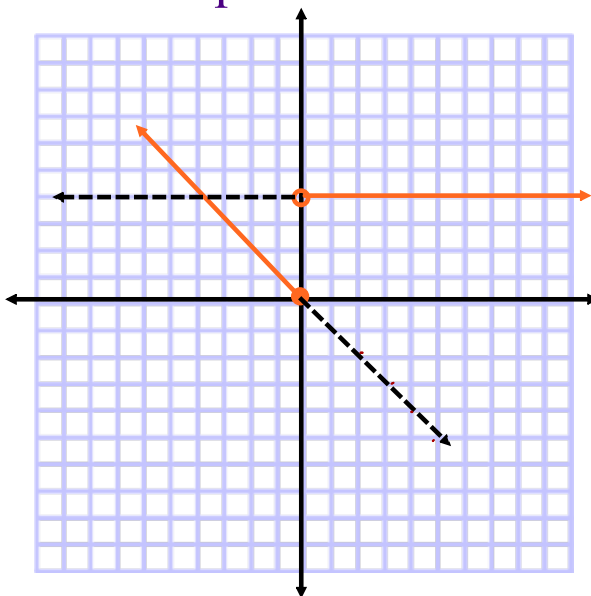
### Objectives:

- 11) I can graph a piecewise function
- 12) I can write the equation of a piecewise function

A piecewise function is a function with a different equations defined over unique intervals of x.

For example:

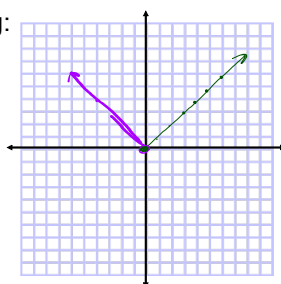
$$f(x) = \begin{cases} -x, & x \leq 0 \\ 4, & x \geq 0 \end{cases}$$



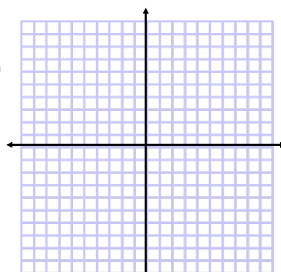
Aug 12-8:01 PM

Graph the following:

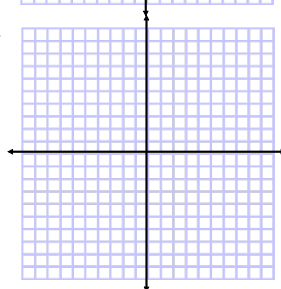
$$f(x) = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$



$$f(x) = \begin{cases} x^2 & \text{if } x \leq 0 \\ \sqrt{x} & \text{if } x > 0 \end{cases}$$



$$f(x) = \begin{cases} x^3, & x < -1 \\ 2^x, & x > 0 \end{cases}$$



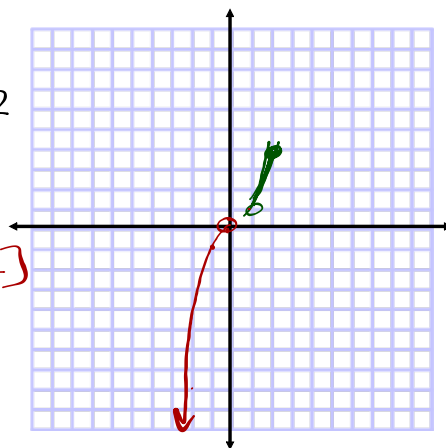
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Graph.

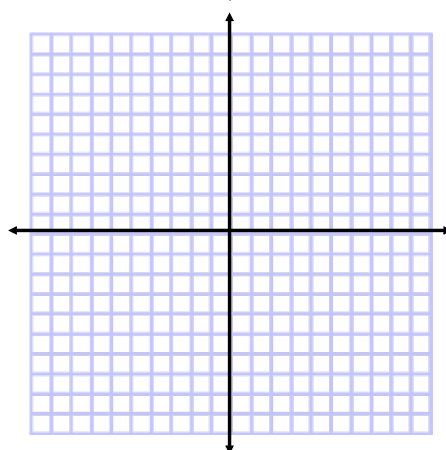
$$f(x) = \begin{cases} x^2, & 1 < x \leq 2 \\ x^3, & x < 0 \end{cases}$$

Dom:  $(-\infty, 0) \cup (1, 2]$

Ran:  $(-\infty, 0) \cup (1, 4]$



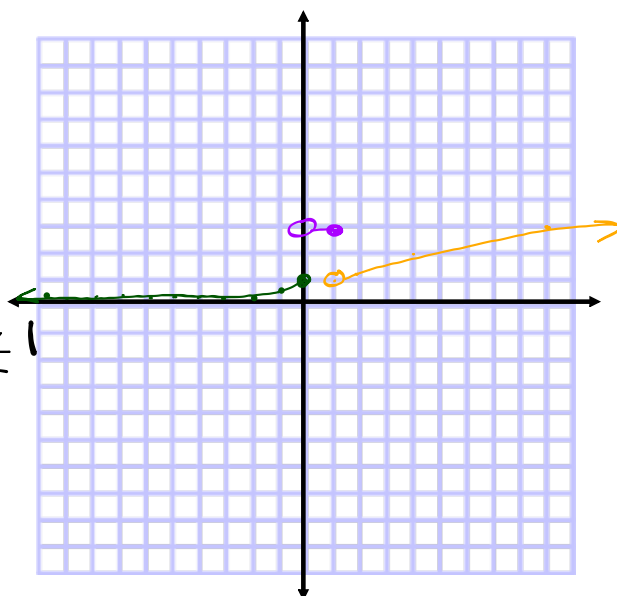
$$f(x) = \begin{cases} x^2, & x \leq -1 \\ \sqrt{x}, & x > 4 \end{cases}$$



Jul 27-10:38 AM

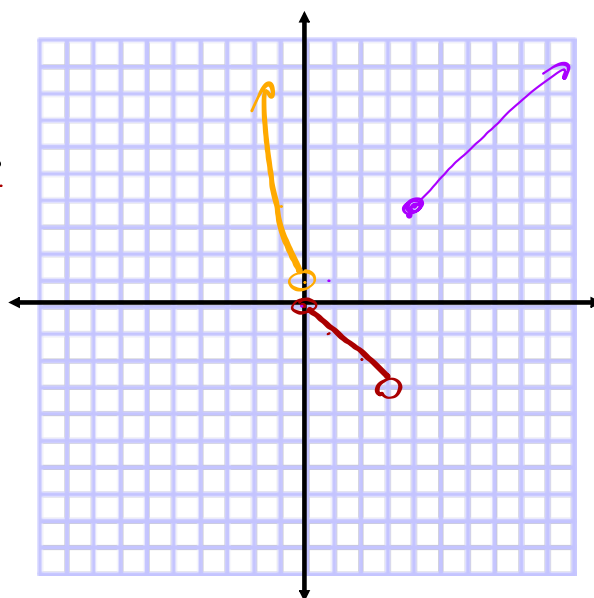
Graph.

$$f(x) = \begin{cases} \sqrt{x}, & x > 1 \\ 2^x, & x \leq 0 \\ 3, & 0 < x \leq 1 \end{cases}$$



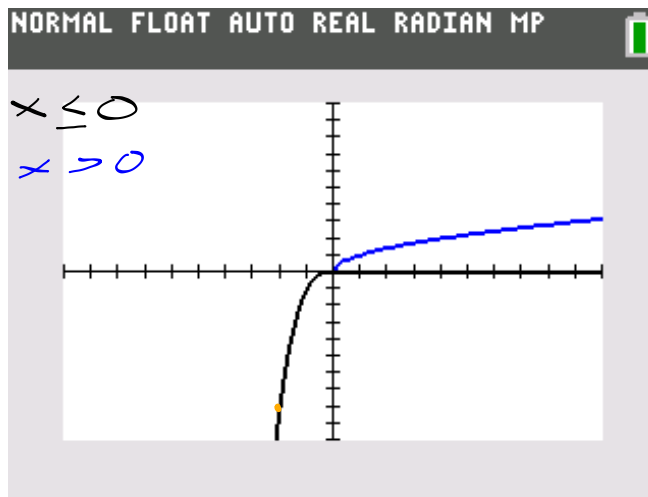
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$$f(x) = \begin{cases} (x-1)^2, & x < 0 \\ -|x|, & 0 < x < 3 \\ x, & x \geq 4 \end{cases}$$



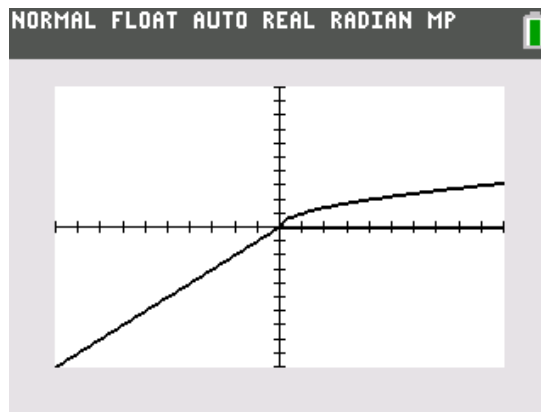
Write the equation for the following piecewise functions

$$f(x) = \begin{cases} x^3, & x \leq 0 \\ \sqrt{x}, & x > 0 \end{cases}$$



Aug 12-8:09 PM

Write the equation for the following piecewise functions.



Aug 13-9:05 AM

Sep 26-7:46 PM