

Algebra 2 Piecewise Functions Notes

Date: _____

Ex: Graph the function: $f(x) = \begin{cases} -2x & x \leq 0 \\ \frac{1}{3}x & x > 0 \end{cases}$

(There are two pieces to this graph. We will look at them individually)

$$f(x) = -2x$$

(only choose x -values that are less than or equal to zero)

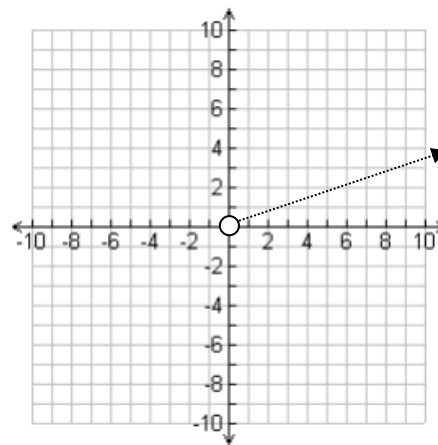
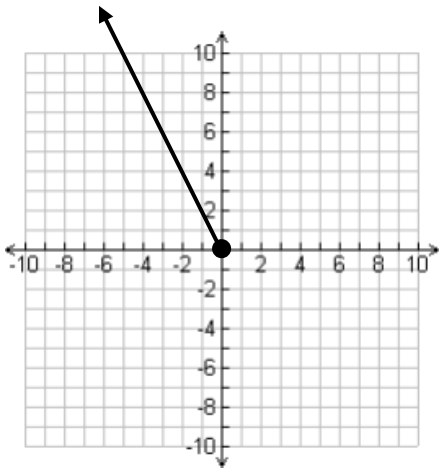
x	y
0	0
-1	2
-2	4
-3	6

$$f(x) = \frac{1}{3}x$$

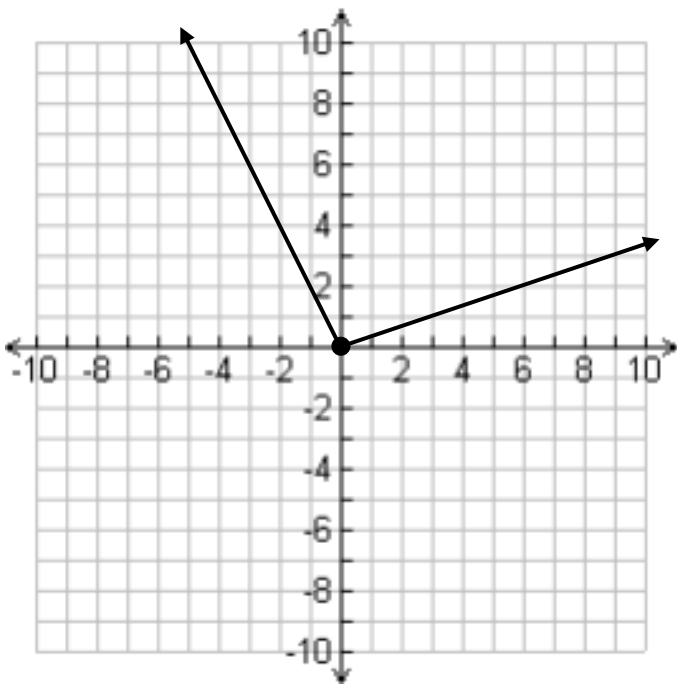
(only choose x -values that are greater than zero)

x	y
3	1
6	2
9	3
0	0

x cannot *equal* zero so this point is a hollow point



Combine the two graphs together and we get this graph of the piecewise function:
(the hollow dot on the graph on the right is filled in by the solid dot on the graph on the left)



Find each value:

$$f(-2) =$$

$$f(5) =$$

$$f(20) =$$

$$f(0) =$$

$$f(-12) =$$

Use the piecewise graph on page one to answer the following:

Describe the end behavior of the graph.

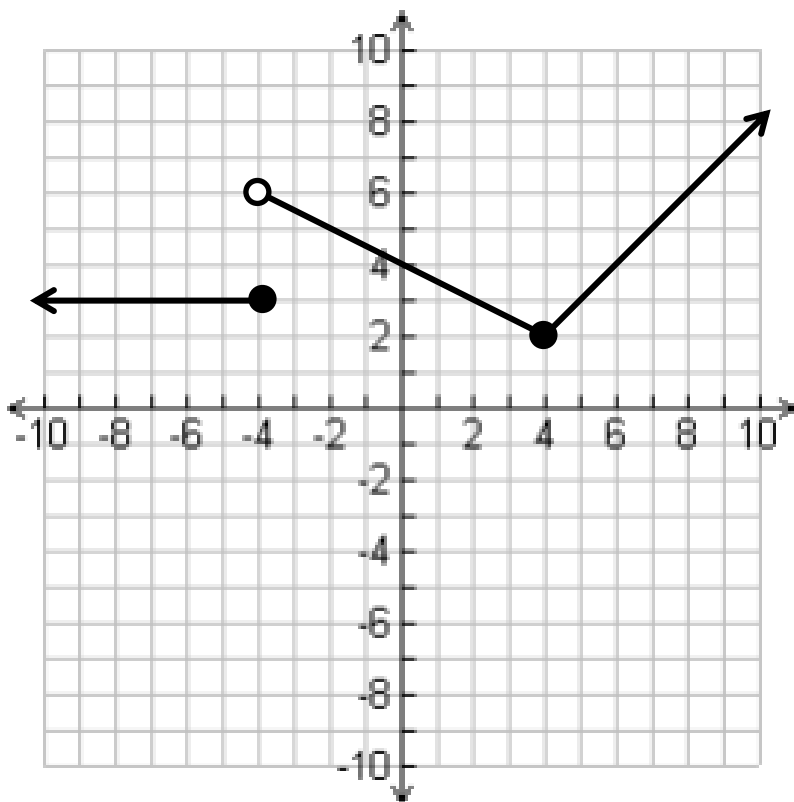
Describe the rate of change (slope) as x goes from $-\infty$ to $+\infty$

On what interval of x is the function increasing? Decreasing?

Extreme values: Are there any relative minimum or maximum points? Where are they located?

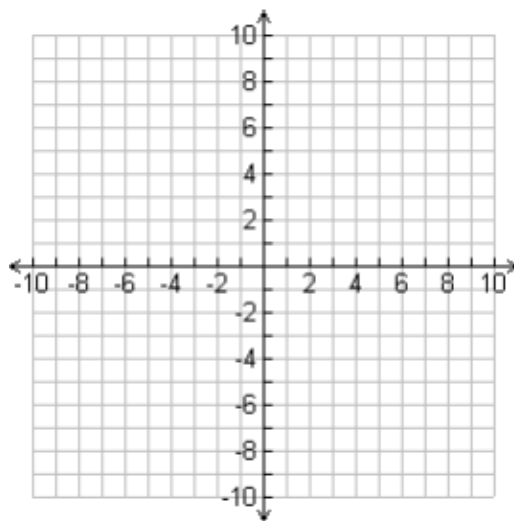
Give the domain and range of the function.

Write the piecewise function for the graph below.

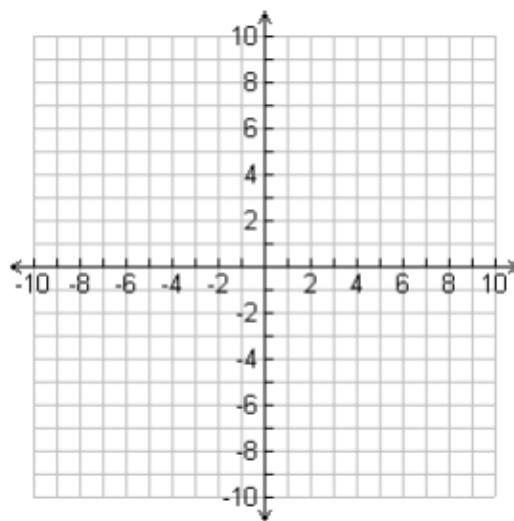


Graph each piecewise function.

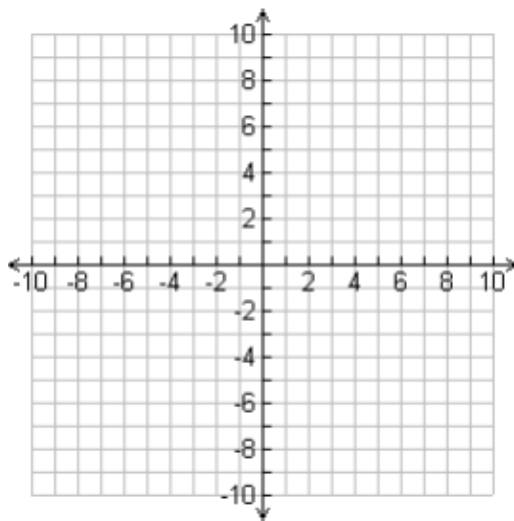
$$f(x) = \begin{cases} -x + 4 & x > 2 \\ 4 & x \leq 2 \end{cases}$$



$$f(x) = \begin{cases} -\frac{1}{2}x & x \leq 0 \\ \frac{1}{3}x + 2 & x > 0 \end{cases}$$



$$f(x) = \begin{cases} -\frac{1}{2}x + 8 & x < -4 \\ x + 4 & -4 \leq x \leq 2 \\ 4 & x > 2 \end{cases}$$



Write the piecewise function that is graphed below.

