1.2 Interval Notation for Domain and Range   Name_____

From your experiences in Algebra 1 & 2, you know how to read a number line and an Inequality. Look at the two examples provided and see if you can carry that into Interval Notation. Discuss the examples as a team and then complete the first four together. Complete the remaining problems on your own and then compare with your team.
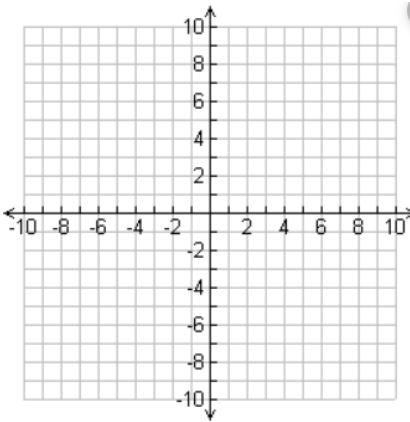
	Inequality	Interval Notation	Graph
Ex.	$-3 \le x < 5$	$[-3, 5)$	
Ex.	$x > 2$	$(2, \infty)$	
1.	$x \le 3$		
2.		$(-\infty, 4)$	
3.			
4.		$[5, \infty)$	
5.			
6.	$x < 1 \text{ or } x \ge 5$		
7.			
8.	x is any real #		
9.			
10.		$(1, 4)$	
11.	$x > 7$		
12.		$[-2, 2]$	

13. Summarize the use of (vs [for Interval Notation. When do we use each one?

14. Practice what you know about families of functions, transformations, and interval notation to graph each of the following; also state the domain and range..
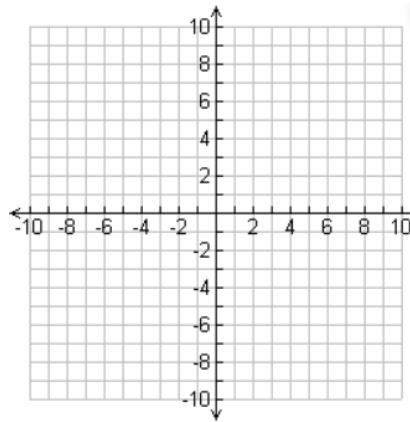
a)

$$y = -2|x - 4| + 1$$

D: R:
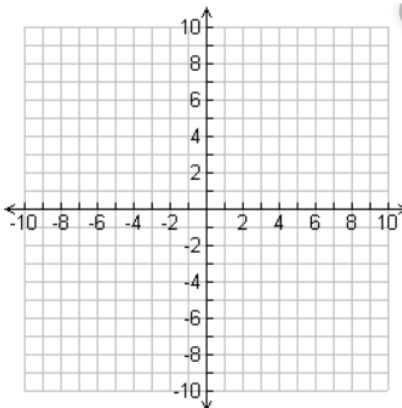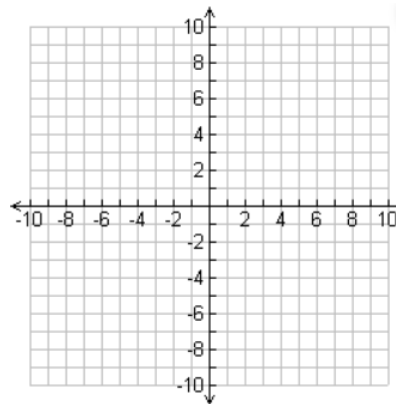
b)

$$y = \frac{1}{2}(x + 4)^2 + 3$$

D: R:

c) $f(x) = (x - 6)^3 + 1$

D: R:

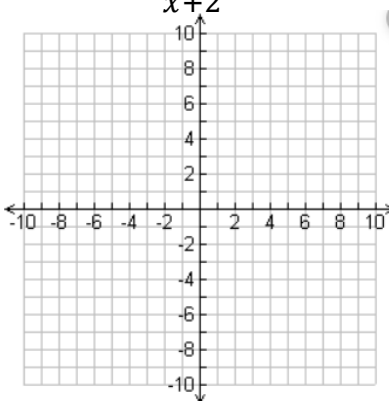d) $g(x) = \sqrt{x + 3} - 5$
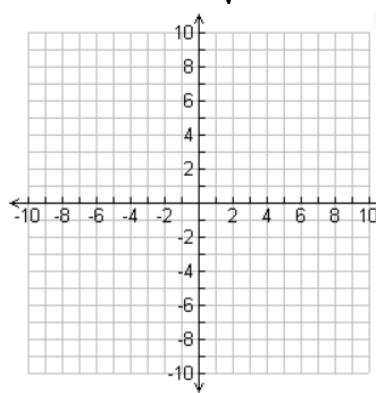

D: R:

e) $h(x) = \dfrac{1}{x+2} - 3$

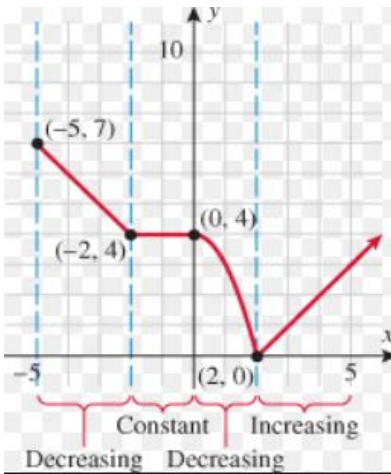D: R:

f) $m(x) = 4\sqrt[3]{(x - 2)} + 4$

D: R:

15. Which families of functions have a domain that is "All Reals" and which functions have a domain restriction? Do you think that this is true for all examples in these families?

EX 1: Another use of interval notation is to describe the parts of the domain where the "y-values" are increasing, constant or decreasing.
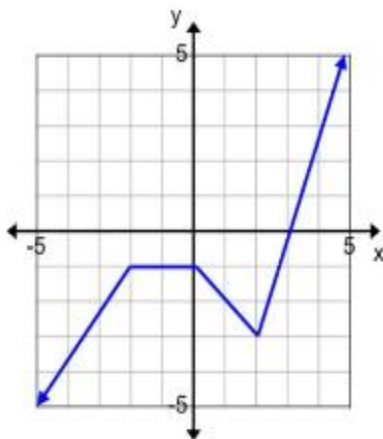

y-values are:

Decreasing: on the x-values [-5,-2] U (0,2]

Constant: on the x-values (-2,0]

Increasing: on the x-values (2,∞)

EX2: This second example uses a shorter way to write it out.

Use interval notation to write the interval(s) over which
$f(x)$ is increasing, decreasing, and constant.

Increasing:

(-∞, -2] U (2, ∞)

Decreasing:

(0, 2]
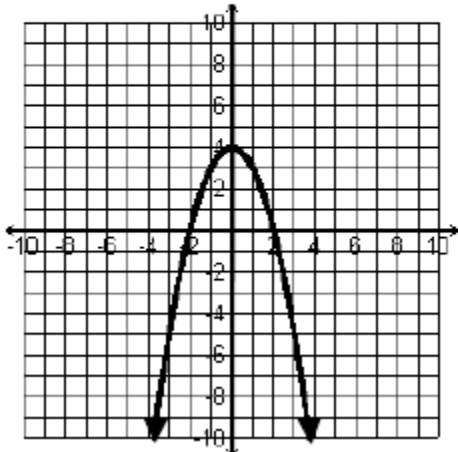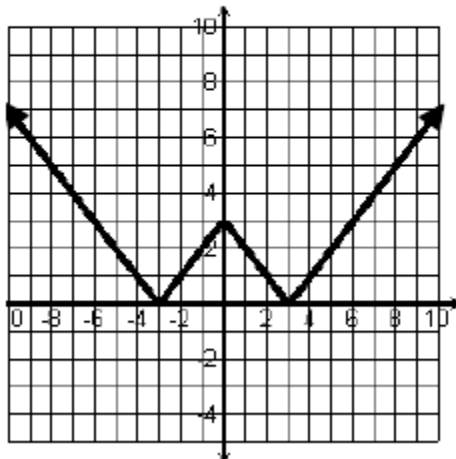
Constant:

(-2, 0]

16. Given the graph of f(x) below find:
On what intervals of x is f(x) increasing?
On what intervals of x is f(x) positive?

17. Given the graph of f(x) below find:
On what intervals of x is f(x) decreasing?
On what intervals of x is f(x) positive?

18. Given the graph of f(x) below find:
On what intervals of x is f(x) constant?
On what intervals of x is f(x) negative?