

The following are topics on the 1<sup>st</sup> Quarter Test. This packet contains reviews for each topic. Solutions are posted on the board and are available on the website. Do NOT complete the entire packet. Complete the reviews for problems with which you need additional practice. Check your answers as you go. If, after checking your answer and trying to find your errors, you still cannot figure it out, ask a group member for help. If still unclear, ask your teacher.

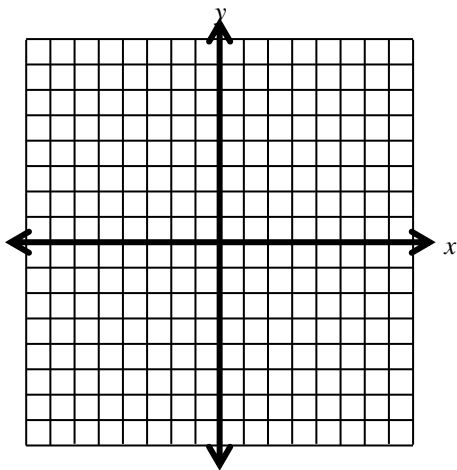
Topic	Pages
Parent Functions constant, linear, quadratic, absolute value, square root	p. 2-3 #1-6, 9 p. 4 #9-10
Graph by Transformations translations, dilations, reflections	p. 2 #1-8 p. 4 #9-10 p. 5 #20-21
Characteristics of Graphs Domain & Range set notation, interval notation Intercepts zeros, x-intercepts, y-intercepts	p. 4 #11-12 p. 5 #15-19, 22-23
Graph Behaviors Increasing/Decreasing End Behavior	p. 4 #13-14 p. 5 #23
Function Operations evaluate, +, -, $\cdot$ , $\div$ , $\circ$	p. 6 #1-8
Solve Absolute Value Equations	p. 7-8 #1-10
Factor Quadratics	p. 9 #1-10

Date of my Quarter 1 Test: \_\_\_\_\_

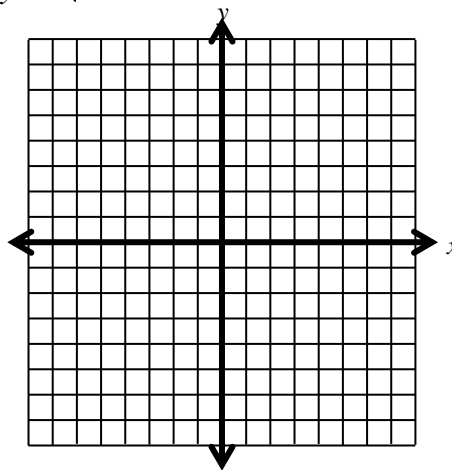
# Review – Parent Functions, Transformations, Intercepts, Increasing/Decreasing, End Behavior, Domain & Range

Graph the following functions, without using your calculator.

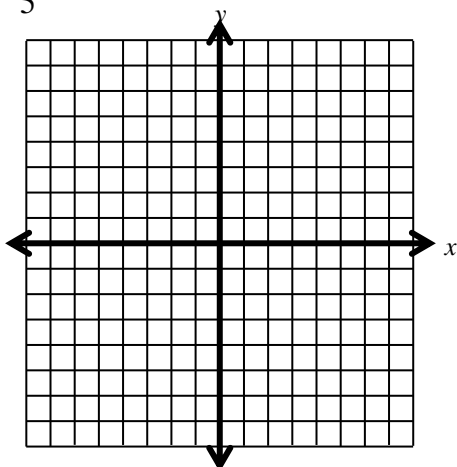
1.  $y = x^2 - 3$



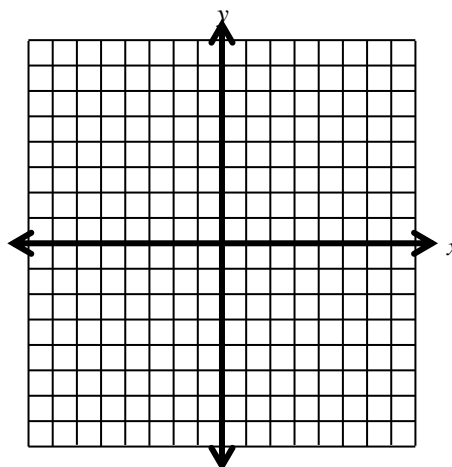
3.  $y = 3\sqrt{x-1}$



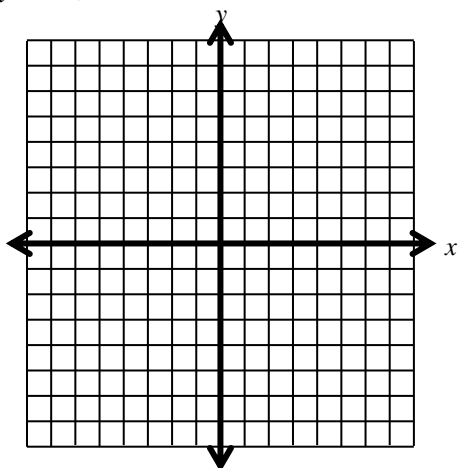
2.  $y = \frac{1}{5}|x+1|$



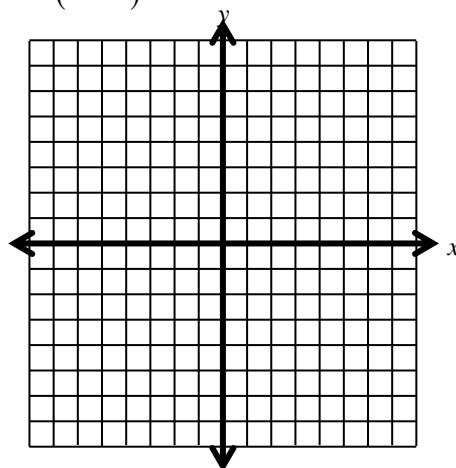
4.  $y = |x+4| - 7$



5.  $y = -\sqrt{x} - 4$

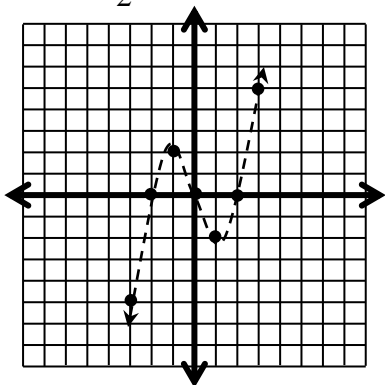


6.  $y = 2(x+4)^2$

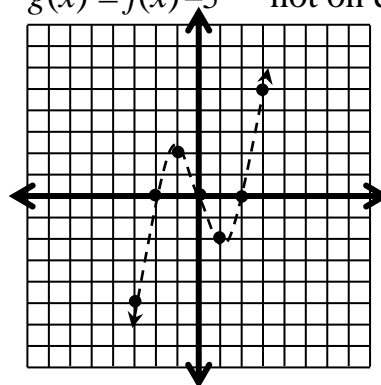


Using the graph of  $f(x)$  dashed below, graph each transformation:

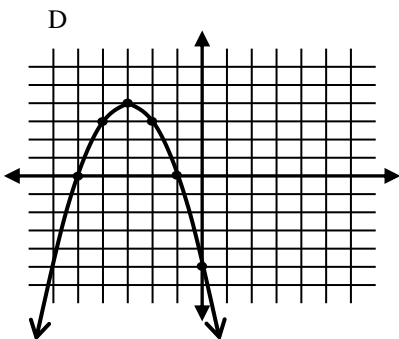
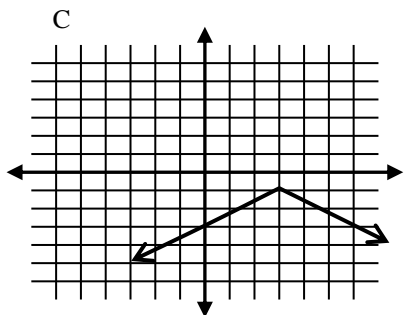
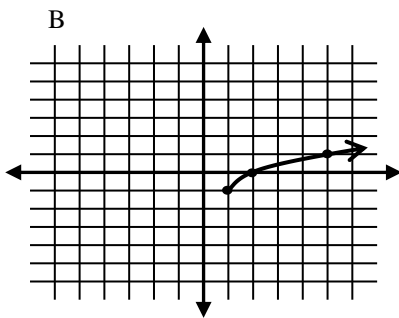
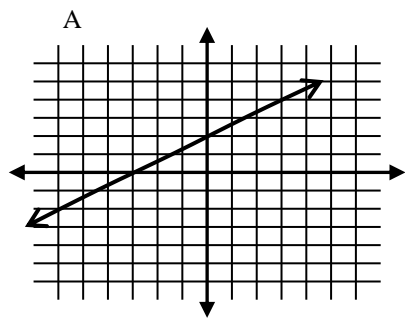
7. **\*\* $k(x) = \frac{1}{2} f(x)$ \*\*** not on quarter test



8. **\*\* $g(x) = f(x) - 5$ \*\*** not on quarter test



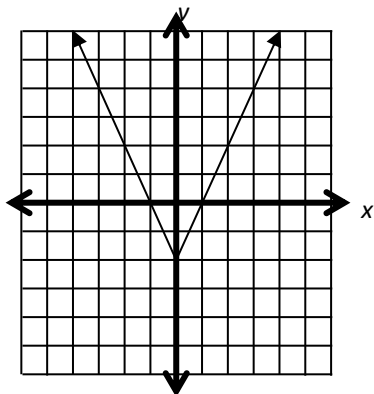
9. Identify each graph with the name of its parent function.



Word Bank  
 Absolute Value  
 Constant  
 Linear  
 Quadratic  
 Square Root

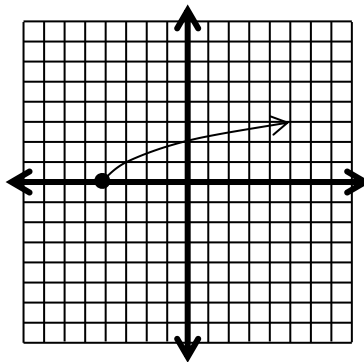
Write an equation to represent each of the following graphs.

10.



Equation: \_\_\_\_\_

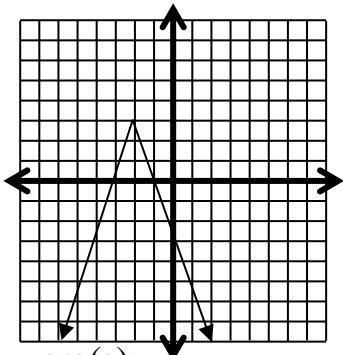
11.



Equation: \_\_\_\_\_

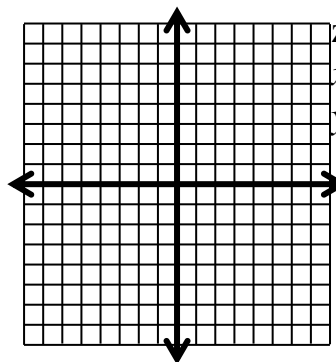
State zeros,  $x$ -intercepts, and  $y$ -intercepts for the following functions, or state "none".

12.



zero(s):  
 $x$ -intercept(s):  
 $y$ -intercept(s):

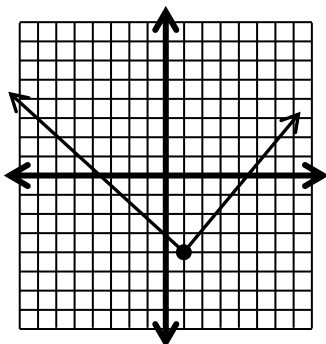
13.  $y = (x + 2)^2 - 1$



zero(s):  
 $x$ -intercept(s):  
 $y$ -intercept(s):

State  $x$ -intervals for which the following functions are increasing and decreasing. Also fill in the blank for the end behavior.

14.

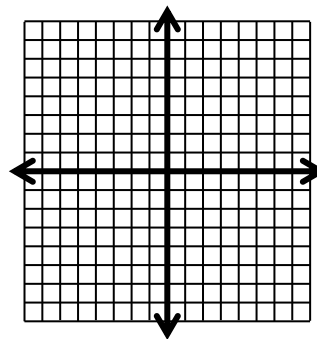


increasing: \_\_\_\_\_  
 decreasing: \_\_\_\_\_

End Behavior:

As  $x \rightarrow \infty$ ,  $y \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow -\infty$ ,  $y \rightarrow$  \_\_\_\_\_.

15.  $f(x) = -(x - 5)^2$   
 (Graph if you want!)

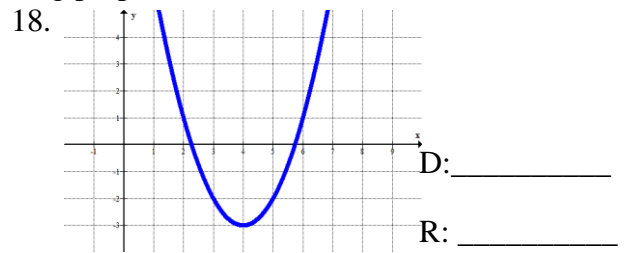
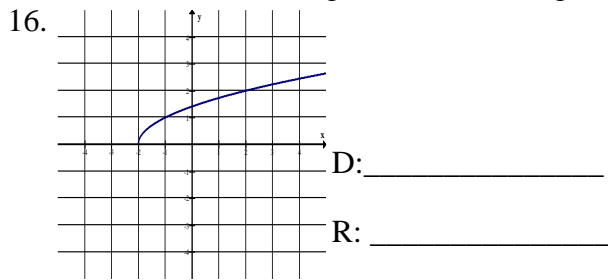


increasing: \_\_\_\_\_  
 decreasing: \_\_\_\_\_

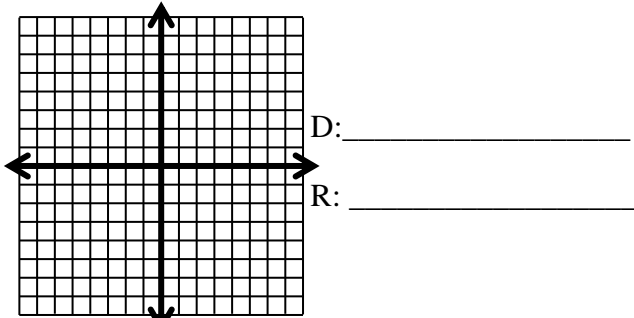
End Behavior:

As  $x \rightarrow \infty$ ,  $y \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow -\infty$ ,  $y \rightarrow$  \_\_\_\_\_.

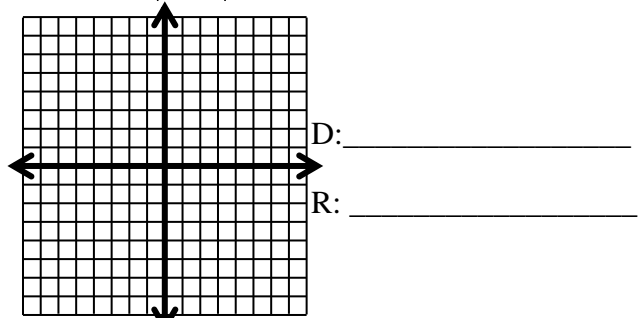
State the domain and range of the following functions using proper set notation:



17.  $f(x) = x^2 - 3$  (Graph if you want!)



19.  $y = -|x+4| - 3$  (Graph if you want!)



20. Circle **ALL** of the following functions that have a range of  $\{y | y \geq -2\}$ .

$y = |x| - 2$

$y = (x + 2)^2$

$y = x + 2$

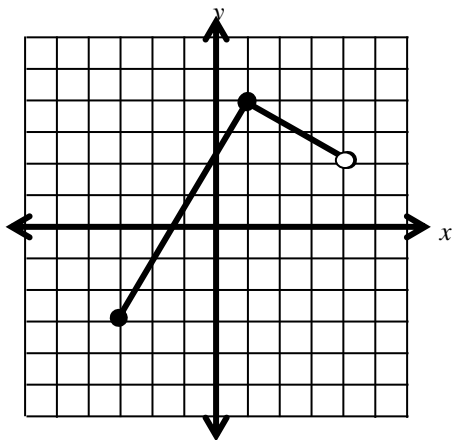
$y = \sqrt{x+2}$

$y = x^2 - 2$

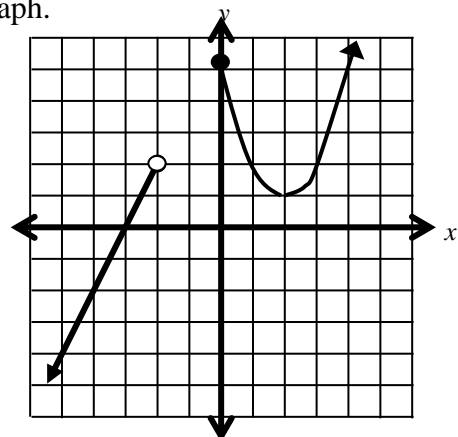
21. Using words, describe how the graph of  $f(x)$  is transformed to get the graph of  $g(x)$  if  $g(x) = 3f(x + 2)$ .

22. Using words, compare and contrast the graphs of  $f(x - 4)$  and  $f(x) - 4$ .

23. State the domain and range for the following graph.



24. State the domain, range, and intervals of increasing and decreasing for the following graph.



## Review – Function Operations

Perform the following function operations and simplify given the following functions:

$$f(x) = 4x$$

$$g(x) = x^2 - x$$

$$h(x) = 2x - 1$$

$$k(x) = \sqrt{x+3}$$

1.  $(g + f)(3a)$

5.  $(g \circ f)(2)$

2.  $(g \cdot f)(x)$

6.  $f(g(3))$

3.  $(f - h)(x)$

7.  $h(g(x))$

4.  $k\left(g\left(\frac{1}{2}\right)\right)$

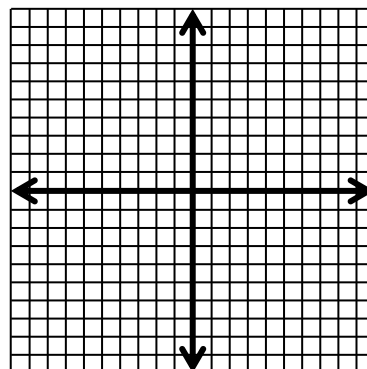
8.  $(g \circ g)(x)$

# Review – Solving Absolute Value Equations

Solve the equations and state your solutions. If your work is algebraic, show all algebra. If your work is graphical, show your graph.

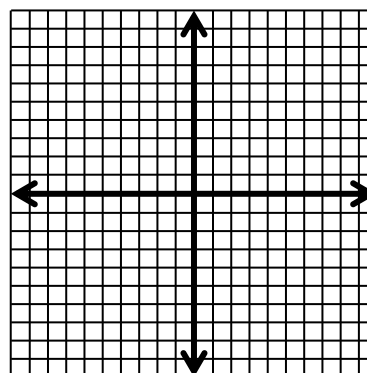
1.  $|x - 5| = 8$

Solution: \_\_\_\_\_



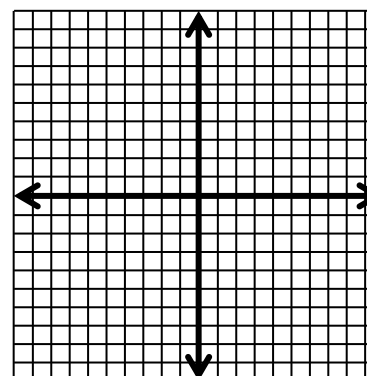
2.  $|2 + 3x| = x - 3$

Solution: \_\_\_\_\_



3.  $x - 3 = \frac{1}{2}|x - 7| + 1$

Solution: \_\_\_\_\_



4. Sally and Jane are working on the following problem together. Sally wants to go through all of the steps to solve the problem algebraically. Jane tells her that that is not necessary because the answer is obvious. What is the correct solution?

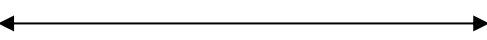
$|8x + 27| = -24$

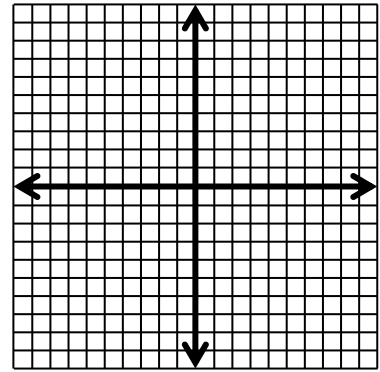
Solution: \_\_\_\_\_

Explain how Jane knows this without doing any work.

5.  $3|x-1| = 2x+9$

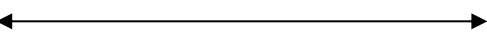
Solution: \_\_\_\_\_

Graph: 

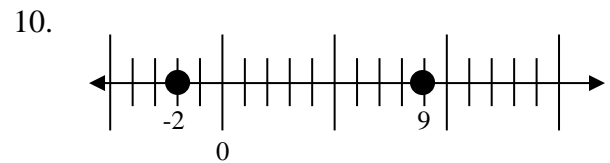
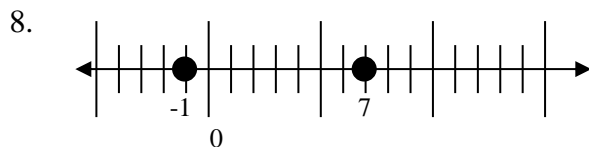
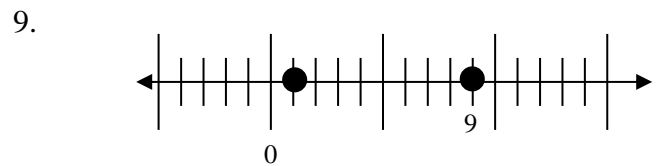
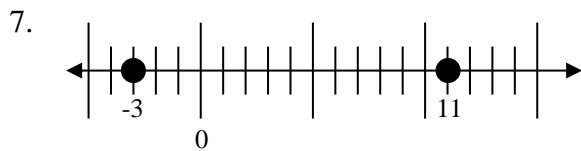


6.  $|3x + 7| - 25 = 12$

Solution: \_\_\_\_\_

Graph: 

Write an ABSOLUTE VALUE equation or inequality whose solution is represented on the number line below.



Select all that apply:

$2|x - 3.5| = 5.5$

$2|x - 7| = 11$

$2|x - 3.5| = 11$

$|2x - 7| = 11$



## Review – Factor Quadratics

Factor each of the following expressions completely.

1.  $16x^2 - 25$

4.  $2x^2 - 7x + 6$

2.  $x^2 + 16x + 64$

5.  $x^3 - x^2 - 12x$

3.  $7a + 21 + 3ax + 9x$

6.  $3x^2 + 18x + 24$

7.  $7x^2 + 19x - 6$

9.  $15x^2 - 10x$

8.  $3n^2 + 5n - 2$

10.  $d^2 - 64$