Math 3 Unit 1: Graphing Functions and Beyond

Unit	Title	Standards
1.1	Parent Graphs	F.IF.7A F.IF 7B, F.IF 7E, F.IF 5
1.2	Translations	F.IF.7A
1.3	Writing Equations	F.BF.3
1.4	Reflections	F.BF 3
1.5	Domain Restriction Graphing	F.IF 5
1.6	Evaluating & Graphing Piecewise-defined Functions	F.BF 3
Unit 1 Review		
Performance Task	Piecewise Function Challenge Map	F.BF 3

Additional Clovis Unified Resources

http://mathhelp.cusd.com/courses/math-3

Clovis Unified is dedicated to helping you be successful in Math 3. On the website above you will find videos from Clovis Unified teachers on lessons, homework, and reviews. Digital copies of the worksheets, as well as hyperlinks to the videos listed on the back are also available at this site.

Math 3 Unit 1: Online Resources

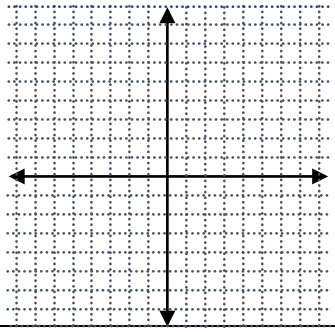
1.1	Parent Graphs	• Desmos: Graphing calculator (not allowed on the test, but a great tool to check answers) https://www.desmos.com/ • Patrick JMT: Basic Graphs that Every Algebra Student Should Know!! http://bit.ly/2rY7MAy • Patrick JMT: Graphing a Parabola (standard form, not vertex form) http://bit.ly/2qFSH71 • Khan Academy: Intro to Graphs of Absolute Value Functions http://bit.ly/2rfGdSc • Khan Academy: Intro to Exponential Functions http://bit.ly/2qKxCU3 • Khan Academy: Intervals and Interval Notation http://bit.ly/216IBlS
1.2	Translations	• Desmos: Graphing calculator (not allowed on the test, but a great tool to check answers) https://www.desmos.com/ • Patrick JMT: Domain and Range From a Graph http://bit.ly/2ssBlGT • Khan Academy: Shifting Functions http://bit.ly/2pZa6T2 • Khan Academy: Graphing Shifted functions http://bit.ly/2ruVIpT
1.3	Writing Equations	• Transformations - Writing Equations from Graphs http://bit.ly/2uvIUP1 • Writing Equations of Transformed Parent Functions (Absolute Value) http://bit.ly/2sRWH04 • Writing Exponential Functions from a Graph http://bit.ly/2sLhS9g • Find the Equation of a Transformed Exponential Function From a Graph http://bit.ly/2uvSaml
1.4	Reflections	• Desmos: Graphing calculator (not allowed on the test, but a great tool to check answers) https://www.desmos.com/ • Patrick JMT: Graph Transformations about the X-axis and Y-axis http://bit.ly/2ssGjnc
1.5	Domain Restriction Graphing	• Desmos: Graphing calculator (not allowed on the test, but a great tool to check answers) https://www.desmos.com/ • Patrick JMT: Finding Domain and Range of a Function using a Graph http://bit.ly/2qKxYtD • Khan Academy: Worked Example: Domain and Range from Graph http://bit.ly/1EjGV3o
1.6	Evaluating & Graphing Piecewise-defined Functions	• Desmos: Graphing calculator (not allowed on the test, but a great tool to check answers) https://www.desmos.com/ • Patrick JMT: Piecewise Defined Functions: Graphing http://bit.ly/2ssMbNd • Patrick JMT: Graphing a Piece-Wise Defined Function – Another Example http://bit.ly/2qFPRyI • Patrick JMT: Piecewise Functions: Find the Formula from a Graph – Ex 1 and Ex 2 http://bit.ly/2qFwPEu and http://bit.ly/2rp40gZ • Patrick JMT: Evaluating Piecewise Defined Functions http://bit.ly/2ruYIlT

Math 3 Unit 1 Worksheet 1 **Name:**_____

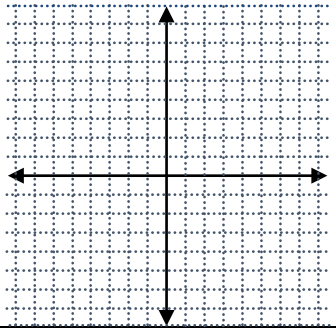
Parent Graphs **Date:**_____ **Per:**_____

[1-15]: Graph each of the following using at least three points and label any asymptotes.

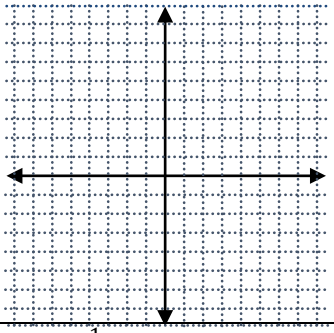
1. $y = \frac{3}{2}x$



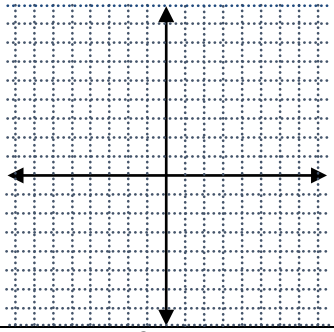
2. $y = -4x^2$



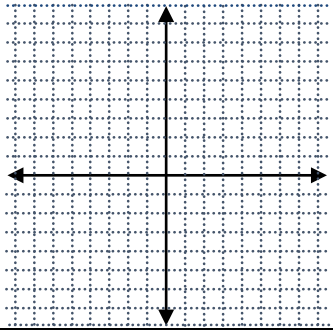
3. $2x = 3y$



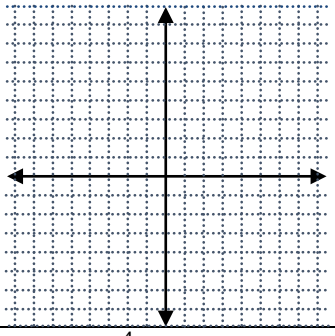
4. $y = 4^x$



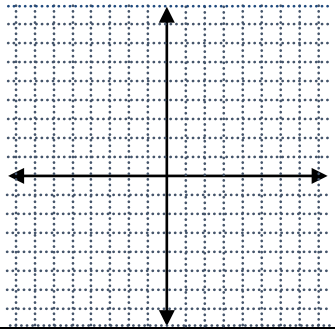
5. $y = -x$



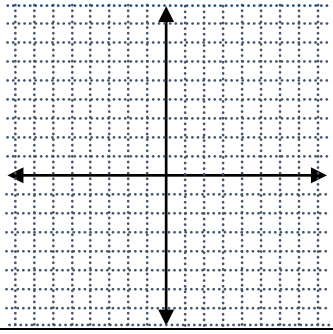
6. $y = \frac{1}{2}x^2$



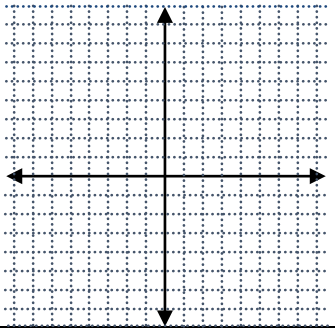
7. $y = -x^2$



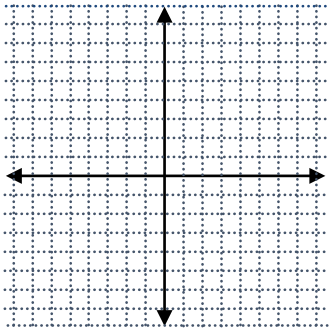
8. $y = 2^x$



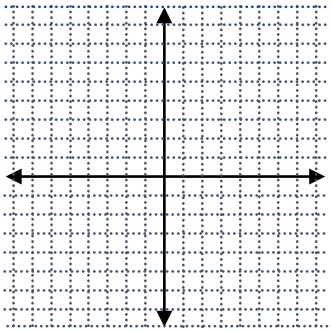
9. $y = -\frac{4}{3}|x|$



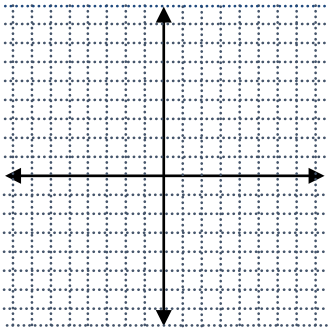
10. $y + 2x = 0$



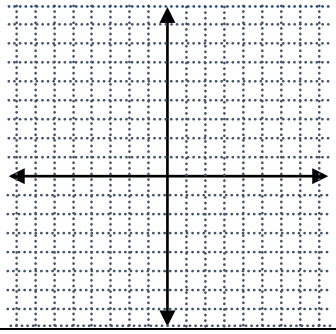
11. $y = -|x|$



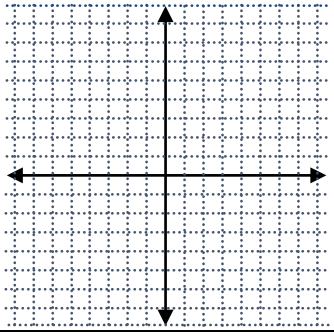
12. $y = -2$



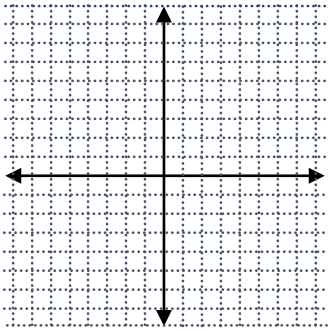
13. $y = 2|x|$



14. $y = 5^x$



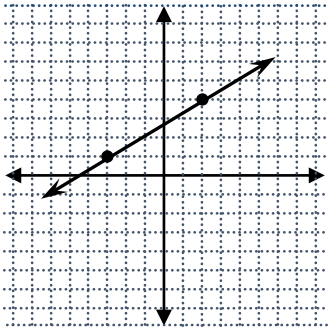
15. $x = 5$



DOMAIN & RANGE

[16-23]: Give the domain and range for each of the following graphs in both inequality **and** interval notation.

16.



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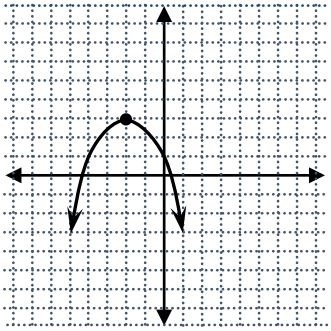

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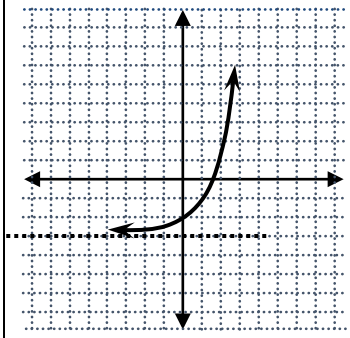
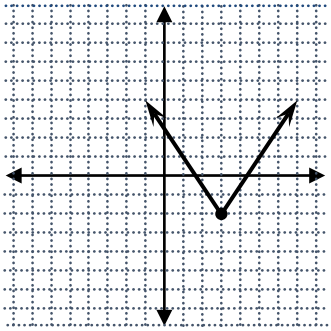
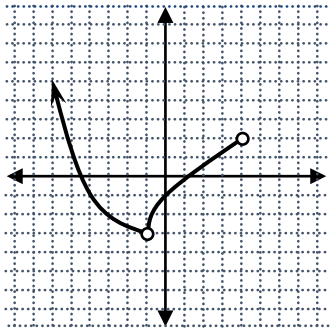


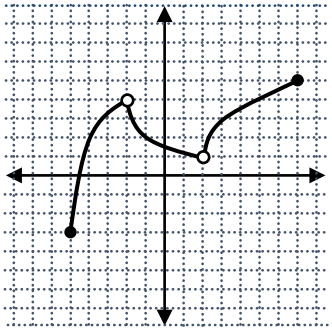
19.



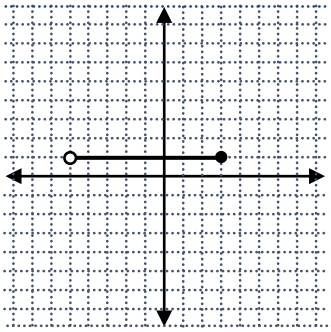
20.



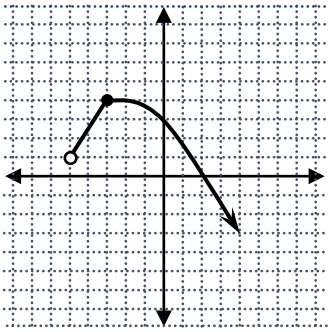
21.



22.

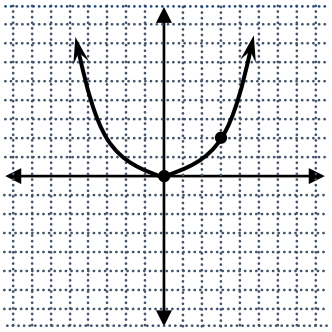
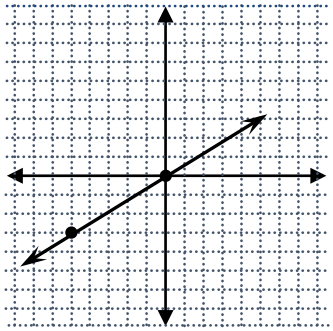
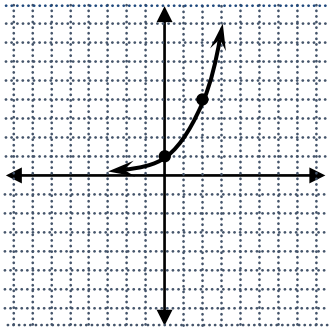
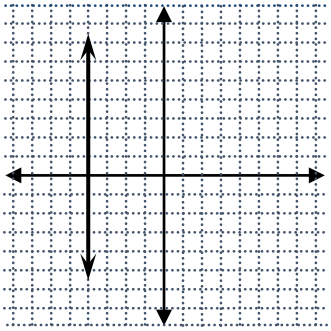
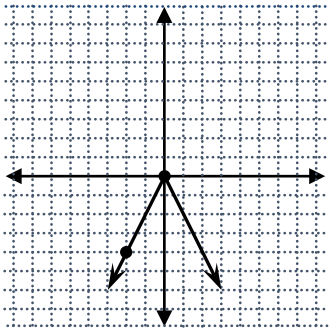
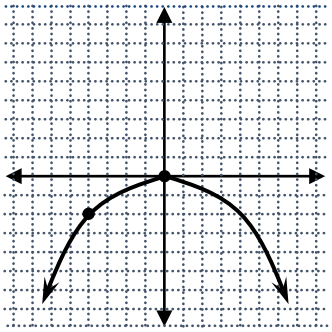
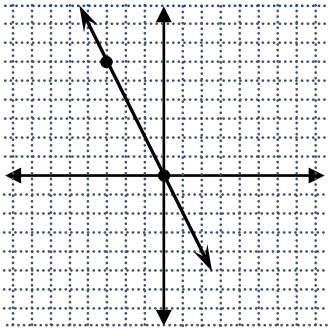
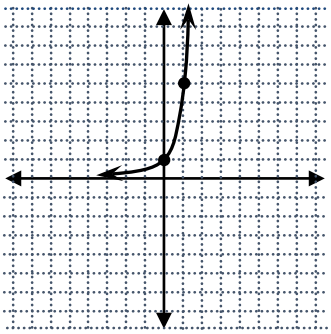
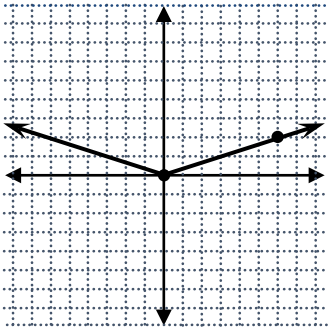


23.



WRITING EQUATIONS

[24-32]: Write the equation for each of the following graphs.

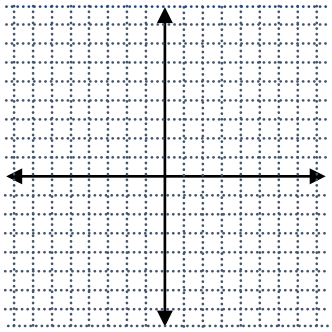
24. 	25. 	26. 
27. 	28. 	29. 
30. 	31. 	32. 

Math 3 Unit 1 Worksheet 2
Translations

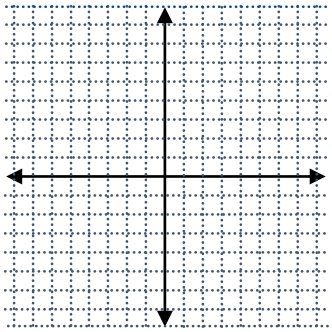
Name:_____
Date:_____ **Per:**_____

[1-9]: A) Graph the following equations. B) State the domain and range of each graph in interval notation.

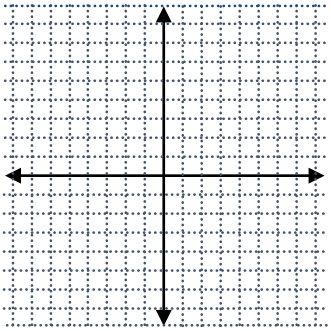
1. $f(x) = 2(x-1)+3$



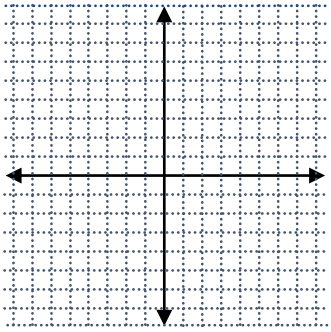
2. $g(x) = (x-2)^2+1$



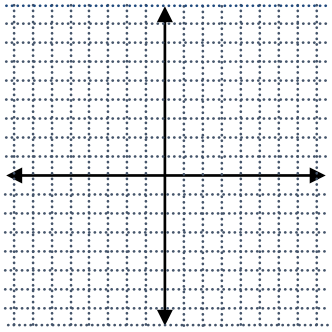
3. $h(x) = 2^{x-1}+4$



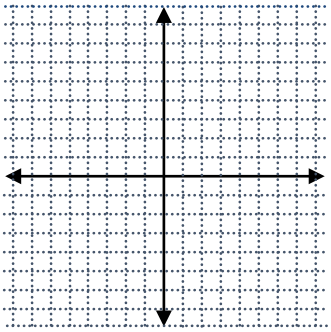
4. $x - 3y = 12$



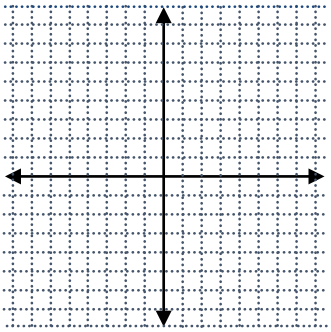
5. $y = -\frac{2}{3}|x+1|$



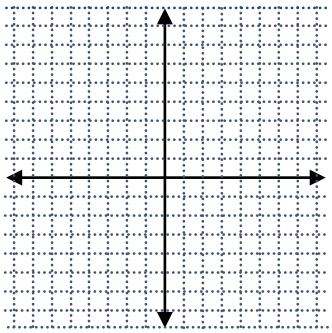
6. $f(x) = -4$



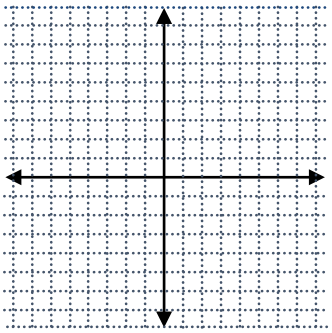
7. $g(x) = -3x^2 - 2$



8. $h(x) = 3^{x+2}$



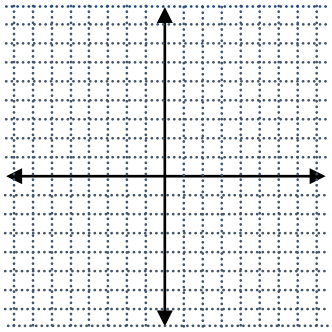
9. $g(x) = 4|x| - 3$



[10-15] Find and graph the composite function.

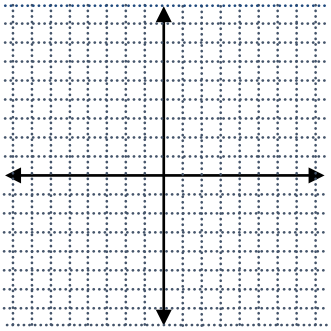
10. $f(x) = x^2$; $g(x) = x - 1$

$f(g(x)) =$



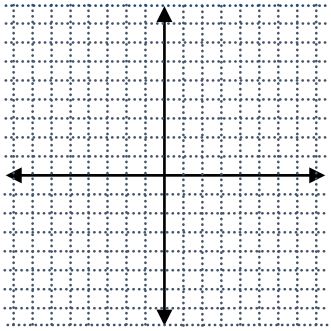
11. $f(x) = x^2$; $g(x) = x + 2$

$f(g(x)) =$



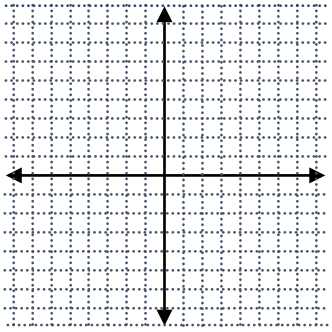
12. $f(x) = x^2$; $g(x) = x - 3$

$f(g(x)) =$



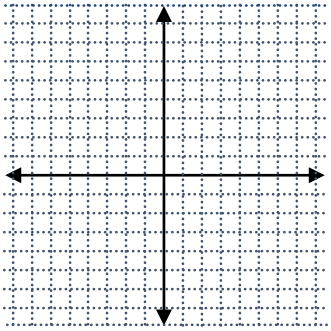
13. $g(x) = -2|x| + 1$; $f(x) = x - 1$

$g(f(x)) =$



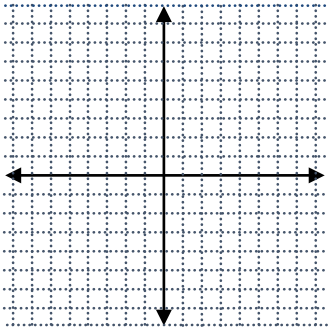
14. $g(x) = -2|x| + 1$; $f(x) = x + 2$

$g(f(x)) =$



15. $g(x) = -2|x| + 1$; $f(x) = x - 3$

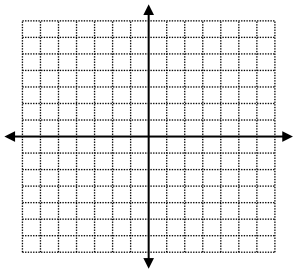
$g(f(x)) =$



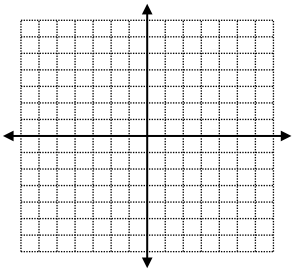
DESCRIBING TRANSLATIONS

[16-18]: A) Graph and label $f(x)$ and $g(x)$ on the same grid. B) Then describe the translation from $f(x)$ to $g(x)$.

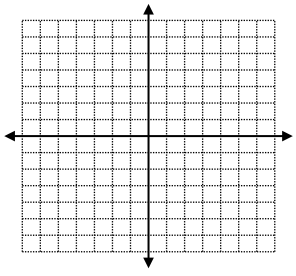
16. $f(x) = 2(x + 1)^2$ and
$g(x) = 2(x - 4)^2 + 3$



17. $f(x) = \frac{1}{2}|x - 3| + 1$ and
$g(x) = \frac{1}{2}|x + 1| + 4$



18. $f(x) = 2^{x-4}$ and
$g(x) = 2^x - 4$

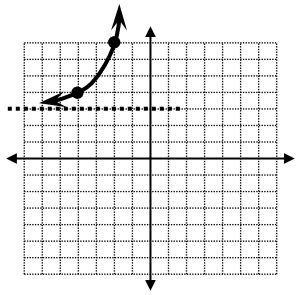


Math 3 Unit 1 Worksheet 3
Writing Equations

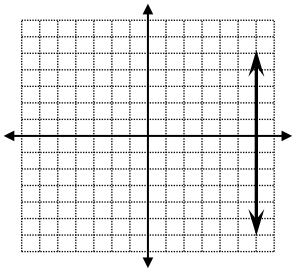
Name:_____
Date:_____ **Per:**_____

[1-9]: Write the equation for each of the following graphs.

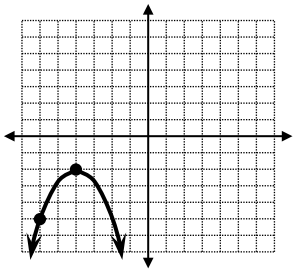
1.



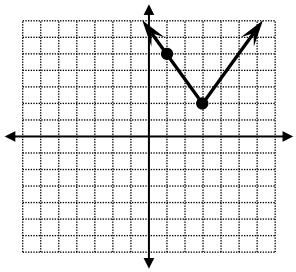
2.



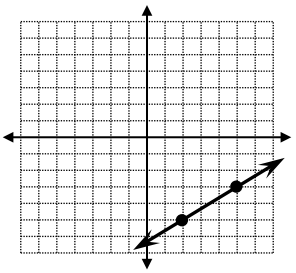
3.



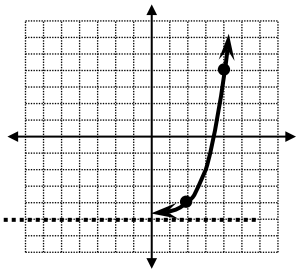
4.



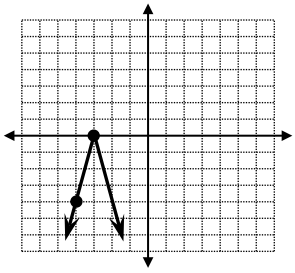
5.



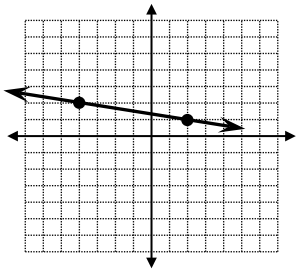
6.



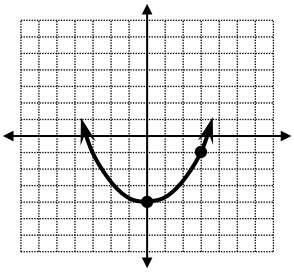
7.



8.



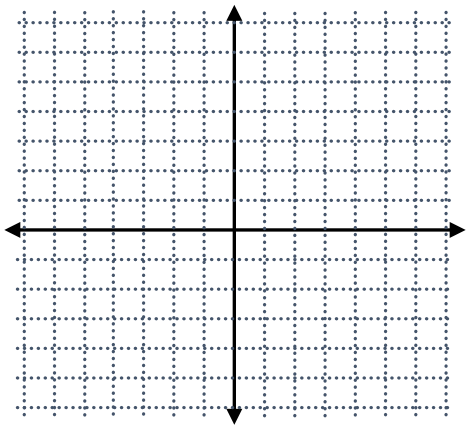
9.



[10-11]: A) Find and simplify $f(x)+g(x)$. B) Sketch $f(x)+g(x)$.

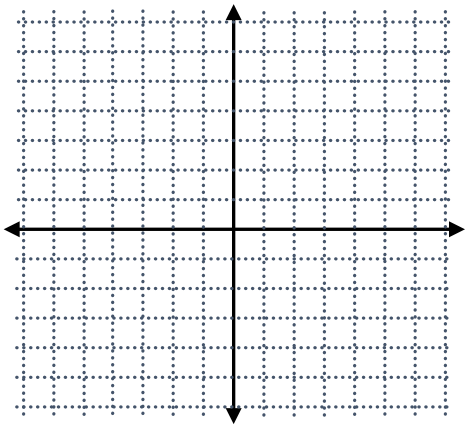
10. $f(x)=1-x^3$ & $g(x)=x^3+x^2-6$

$f(x)+g(x)=$



11. $f(x)=2x^2-7x+3$ & $g(x)=2x(3-x)$

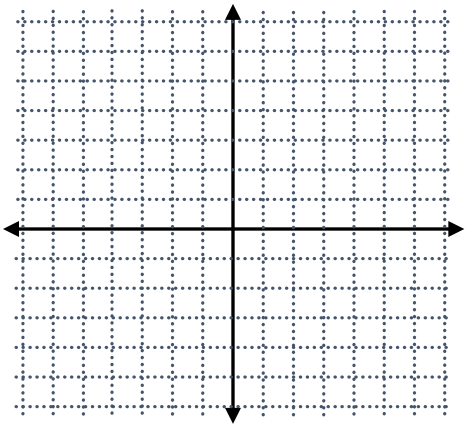
$f(x)+g(x)=$



[12-13]: A) Find and simplify $f(x)-g(x)$. B) Sketch $f(x)-g(x)$.

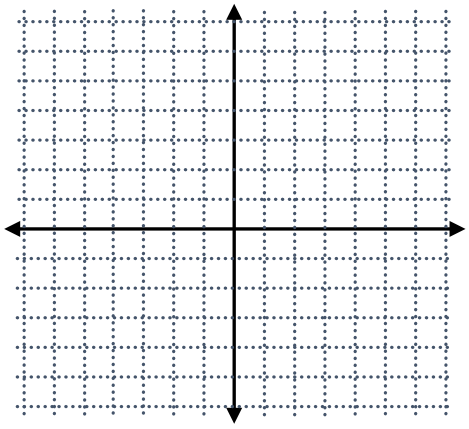
12. $f(x)=x^2+1$ & $g(x)=2$

$f(x)-g(x)=$



13. $f(x)=2|x+1|$ & $g(x)=-2$

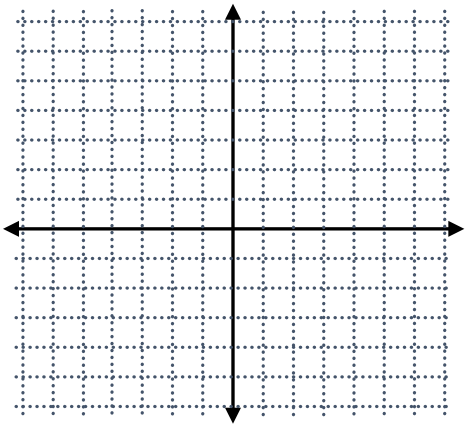
$f(x)-g(x)=$



[14-15]: A) Find $f(g(x))$. B) Sketch $f(g(x))$.

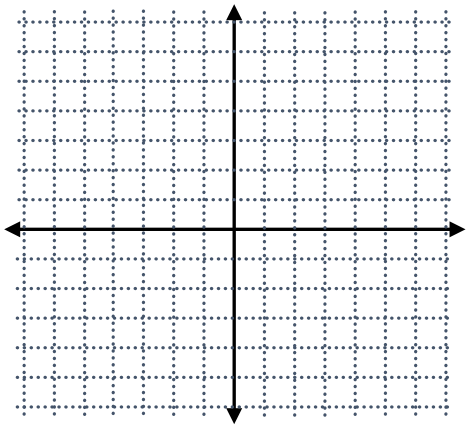
14. $f(x)=\frac{1}{2}x+1$ & $g(x)=x+4$

$f(g(x))=$



15. $f(x)=5-2x^2$ & $g(x)=x+2$

$f(g(x))=$

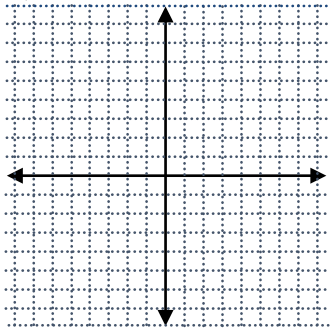
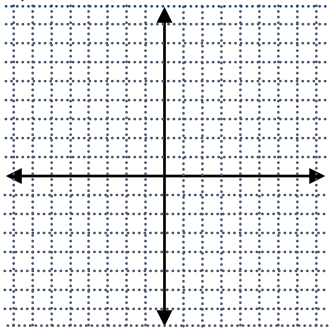
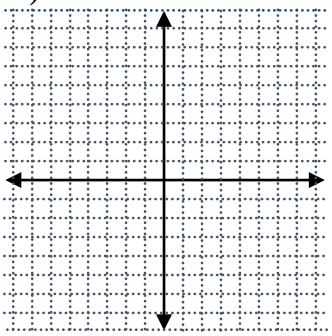
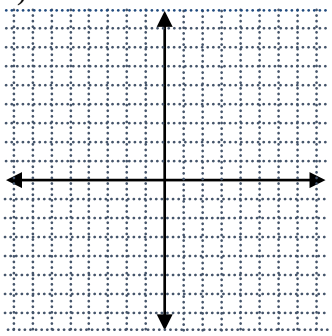
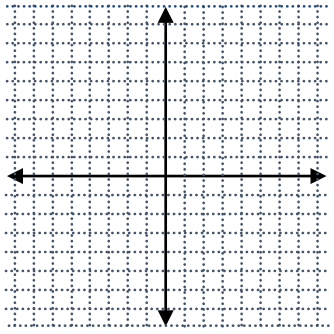
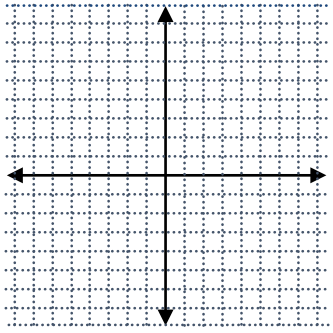
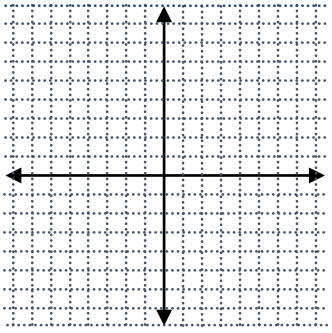
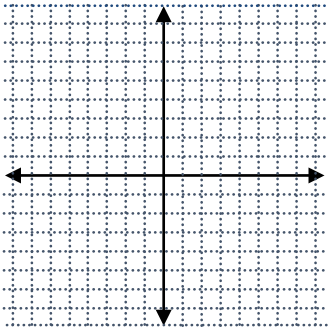


Math 3 Unit 1 Worksheet 4
Reflections

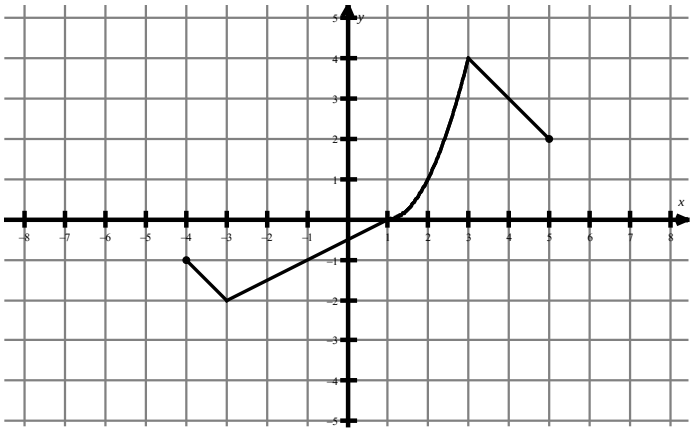
Name:_____
Date:_____ **Per:**_____

[1-8]: A) Graph the following equations. B) Describe the translation(s) of the original function from the parent graph.

C) Describe the reflection from the original function to the modified function.

1. $f(x) = 2(x-1)+3$ and $-f(x)$ A)  B) C)	2. $g(x) = 2^x + 3$ and $-g(x)$ A)  B) C)	3. $h(x) = 2(x-3)^2 - 4$ and $h(-x)$ A)  B) C)	4. $j(x) = \frac{3}{2}\lvert x-1\rvert$ and $j(-x)$ A)  B) C)
5. $f(x) = -x^2 + 4$ and $-f(x)$ A)  B) C)	6. $g(x) = -\frac{2}{3}(x+4)$ and $g(-x)$ A)  B) C)	7. $h(x) = \frac{1}{4}\lvert x\rvert - 2$ and $-h(x)$ A)  B) C)	8. $j(x) = 3^{x+2} - 1$ and $j(-x)$ A)  B) C)

[9-13]: Given $f(x)$ below, graph the following and state their domains and ranges.

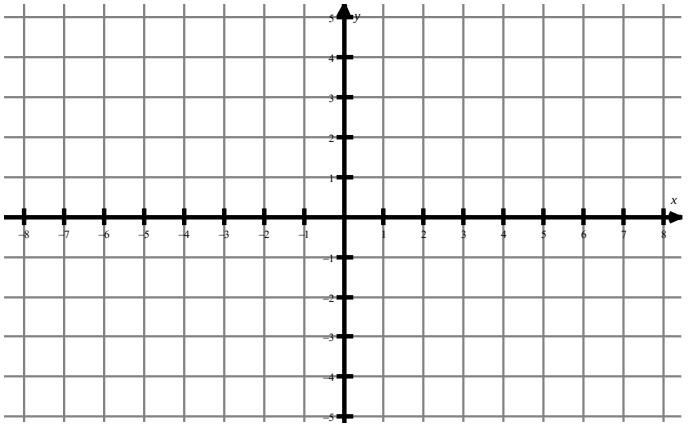


9. State the domain and range of $f(x)$

Domain:

Range:

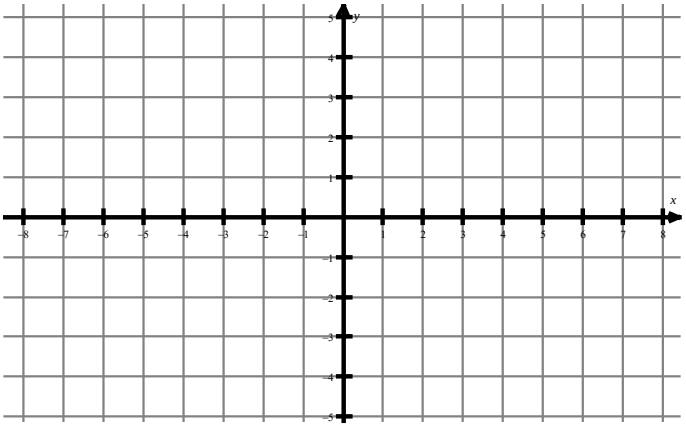
10. $-f(x)$



Domain:

Range:

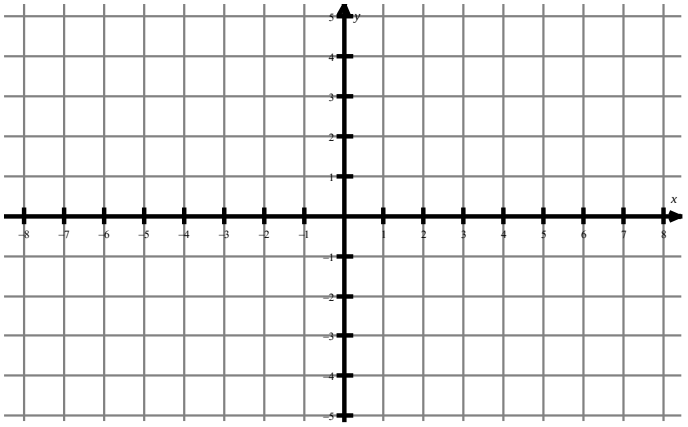
11. $f(-x)$



Domain:

Range:

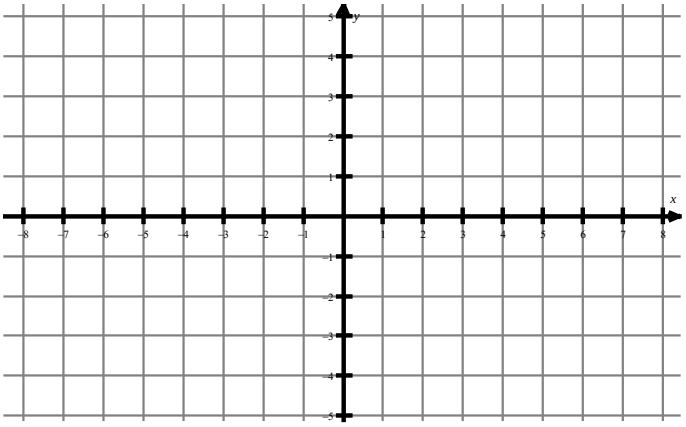
12. $f(x+3)+1$



Domain:

Range:

13. $f(x-2)-3$



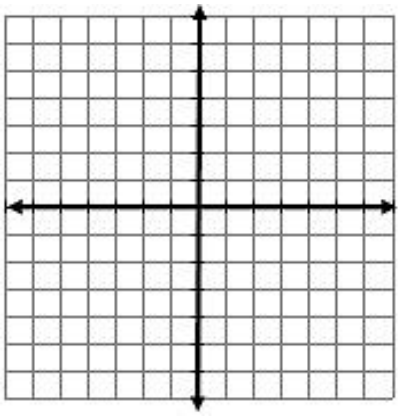
Domain:

Range:

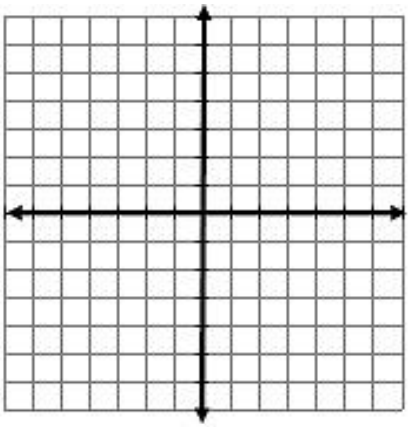
Math 3 Unit 1 Worksheet 5 **Name:**_____
Domain Restriction Graphing **Date:**_____ **Per:**_____

Sketch the restricted function and state the domain and range in interval notation of the **restricted function**.

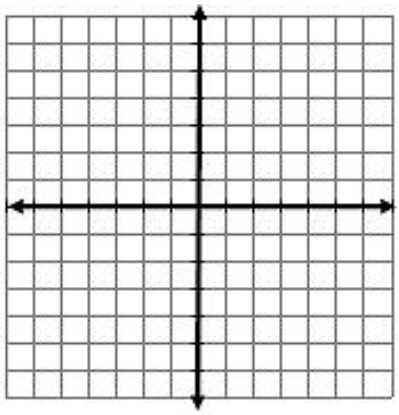
1. $f(x) = x^2$
$f(-2) =$
Graph $f(x)$ if $x > -2$



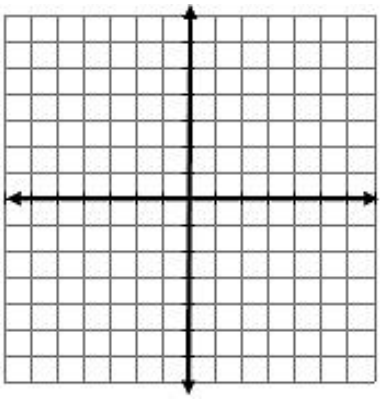
2. $f(x) = x$
$f(-1) =$
Graph $f(x)$ if $x > -1$



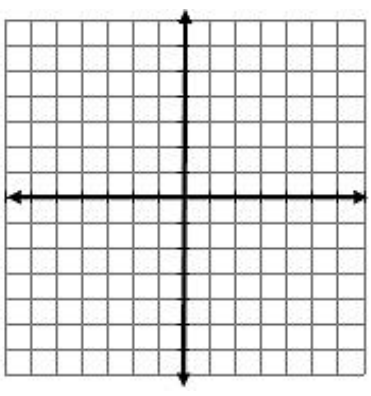
3. $f(x) = -x^2$
$f(1) =$
Graph $f(x)$ if $x \geq 1$



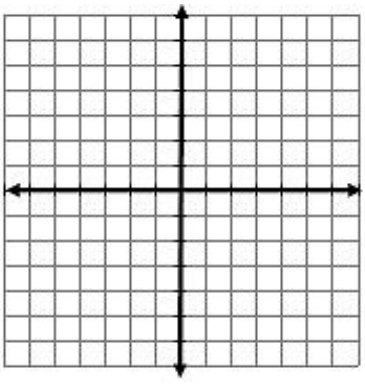
4. $f(x) = 4$
$f(-1) =$
Graph $f(x)$ if $x = -1$



5. $f(x) = -3$
$f(0) =$ $f(6) =$
Graph if $f(x)$ if $0 < x \leq 6$



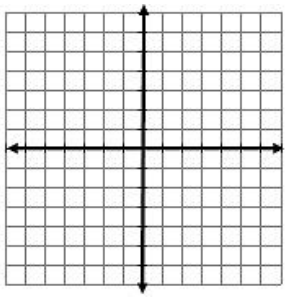
6. $f(x) = |x|$
$f(-1) =$
Graph $f(x)$ if $x \neq -1$



7. $f(x) = 2^x$

$f(-2) =$

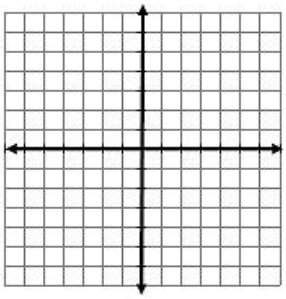
Graph $f(x)$ if $x \geq -2$



8. $f(x) = 3x - 1$

$f(0) =$

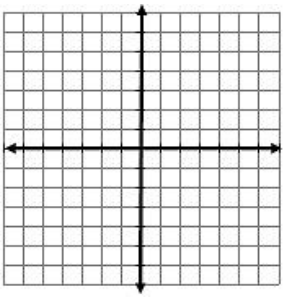
Graph $f(x)$ if $x < 0$



9. $f(x) = -(x+2)^2 + 3$

$f(-3) =$

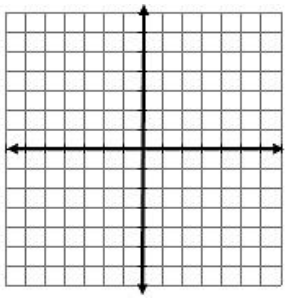
Graph $f(x)$ if $x \geq -3$



10. $f(x) = |x - 4| - 2$

$f(-1) =$ $f(5) =$

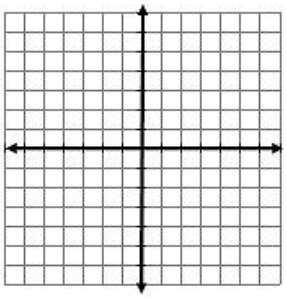
Graph $f(x)$ if $-1 < x \leq 5$



11. $f(x) = 2^x - 1$

$f(3) =$ $f(-1) =$

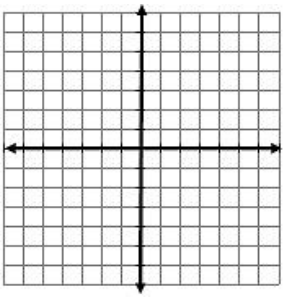
Graph $f(x)$ if $-1 < x \leq 3$



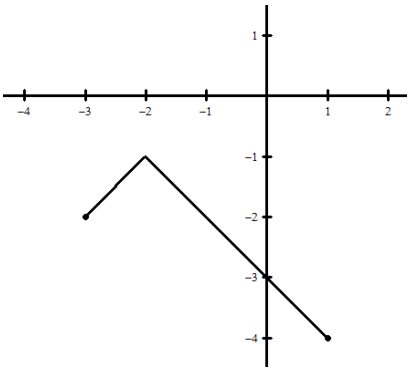
12. $f(x) = (x+4)^2 - 3$

$f(-2)$

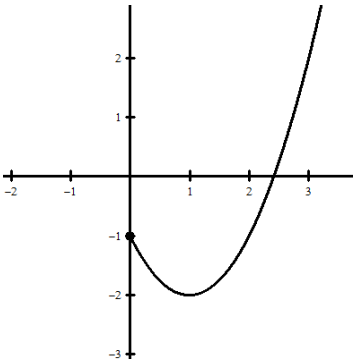
Graph $f(x)$ if $x \leq -2$



13. $f(x) =$ _____ if_____



14. $f(x) =$ _____ if_____



Math 3 Unit 1 Worksheet 6 **Name:**_____

Evaluating & Graphing Piecewise-defined Functions **Date:**_____ **Per:**_____

[1-2] Evaluate. (Do not graph.)

1. If $f(x) = \begin{cases} x^2 - 3 & \text{if } x < 1 \\ -2x + 1 & \text{if } x \geq 1 \end{cases}$

then a) $f(0) =$ ___ b) $f(-2) =$ ___ c) $f(2) =$ ___

d) $f(1) =$ ___ e) $f(-1) =$ ___

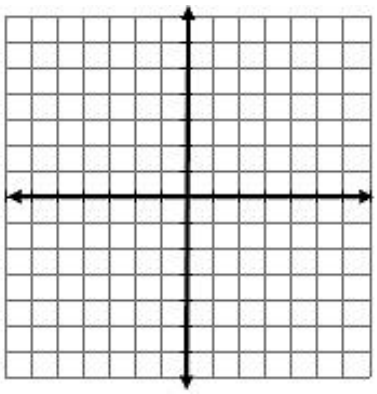
2. If $g(x) = \begin{cases} 4 - 2|x + 3| & \text{if } x \leq -1 \\ 2^{x+1} - 3 & \text{if } x > -1 \end{cases}$

then a) $g(0) =$ ___ b) $g(-2) =$ ___ c) $g(2) =$ ___

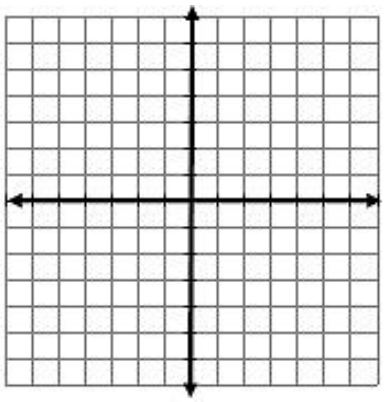
d) $g(1) =$ ___ e) $g(-1) =$ ___

[3-8] Graph the following. Show significant points. State the **domain** and the **range**.

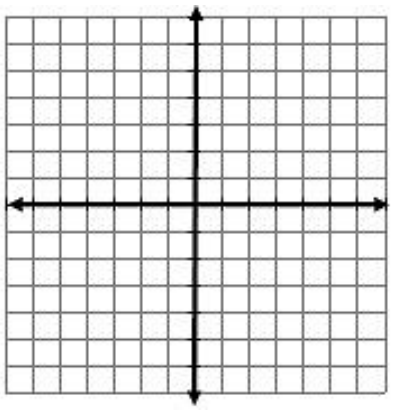
3. $f(x) = \begin{cases} 4 & \text{if } x < -2 \\ 2x + 3 & \text{if } x \geq -2 \end{cases}$



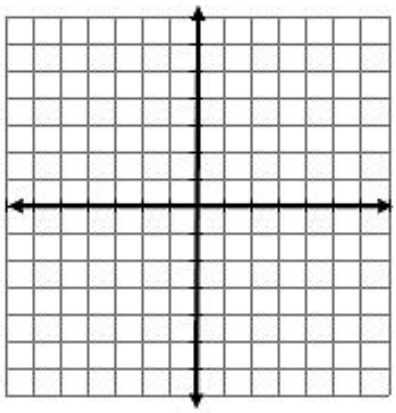
4. $f(x) = \begin{cases} x^2 & \text{if } x > 1 \\ -x^2 & \text{if } x \leq 1 \end{cases}$



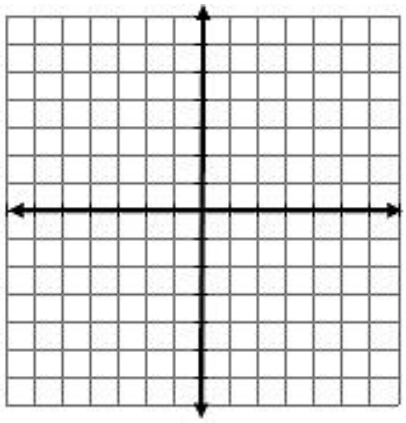
5. $f(x) = \begin{cases} 3^{x+1} & \text{if } x \geq -1 \\ -2|x + 2| + 3 & \text{if } x < -1 \end{cases}$



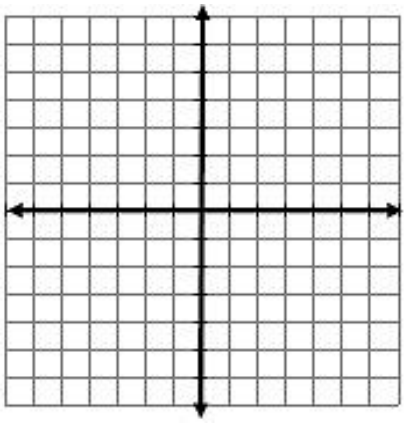
6. $f(x) = \begin{cases} -2x - 1 & \text{if } x < 3 \\ -x^2 + 10 & \text{if } x > 3 \end{cases}$



7. $f(x) = \begin{cases} (x + 3)^2 & \text{if } x < -2 \\ |x| - 1 & \text{if } x > -2 \end{cases}$

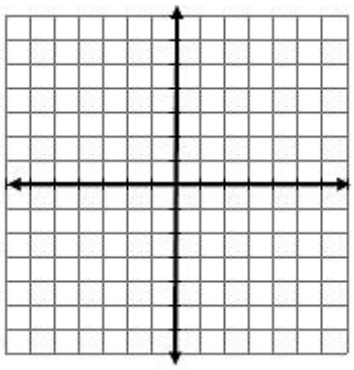


8. $f(x) = \begin{cases} 5 & \text{if } x < 0 \\ 2x & \text{if } x \geq 0 \end{cases}$



[9-14] Graph the following and evaluate the given values.

9. $f(x) = \begin{cases} (x-3)^2 & \text{if } x > 1 \\ 4 & \text{if } -3 \le x \le 1 \end{cases}$

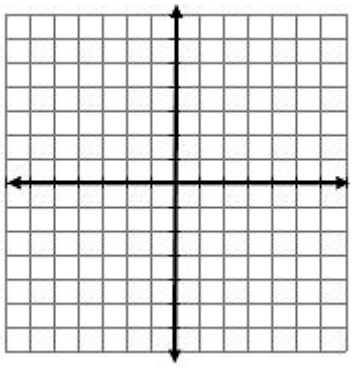


$f(4) =$

$f(0) =$

$f(-3) =$

10. $f(x) = \begin{cases} \frac{1}{2}x + 3 & \text{if } x < 0 \\ -x^2 & \text{if } 0 < x < 2 \end{cases}$

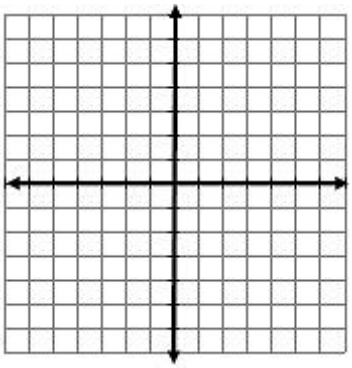


$f(3) =$

$f(1) =$

$f(-2) =$

11. $f(x) = \begin{cases} x^2 - 5 & \text{if } x \le 0 \\ 4 & \text{if } 0 < x \le 3 \\ 2^{x-1} - 9 & \text{if } x > 3 \end{cases}$

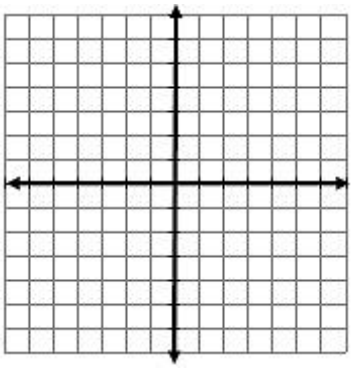


$f(-2) =$

$f(0) =$

$f(4) =$

12. $f(x) = \begin{cases} 5 & \text{if } x \le -3 \\ 2x + 1 & \text{if } -3 < x \le 1 \\ x^2 & \text{if } 1 < x < 2 \end{cases}$

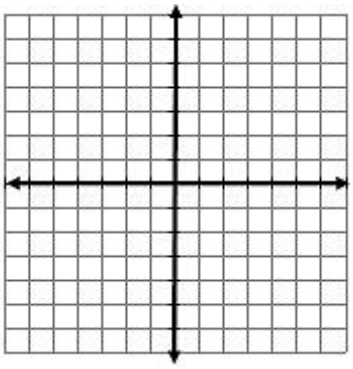


$f(-8) =$

$f(0) =$

$f(6) =$

13. $f(x) = \begin{cases} 2|x-1| - 3 & \text{if } x \le -2 \\ 3 & \text{if } -2 < x \le 3 \\ -|x+2| & \text{if } x > 3 \end{cases}$

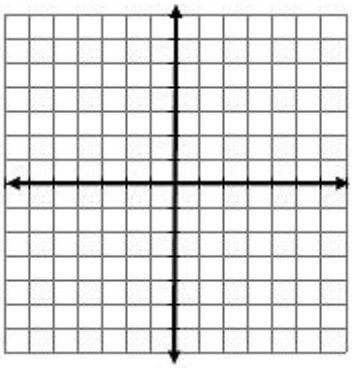


$f(0) =$

$f(5) =$

$f(-2) =$

14. $f(x) = \begin{cases} 3 & \text{if } x = 2 \\ 2x + 1 & \text{if } x \ne 2 \end{cases}$



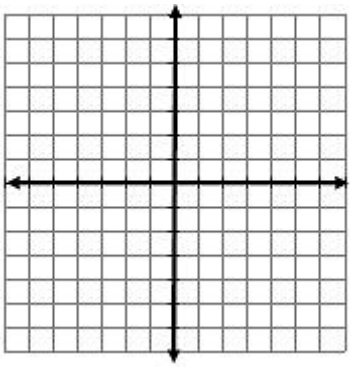
$f(2) =$

$f(0) =$

$f(-4) =$

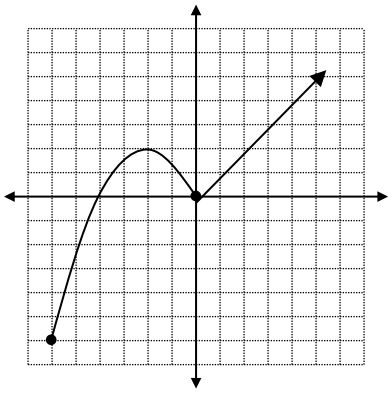
15. Graph

$$f(x) = \begin{cases} 2 \text{ if } 1 < x \leq 3 \\ 4 \text{ if } 3 < x < 5 \\ 6 \text{ if } 5 \leq x < 7 \end{cases}$$

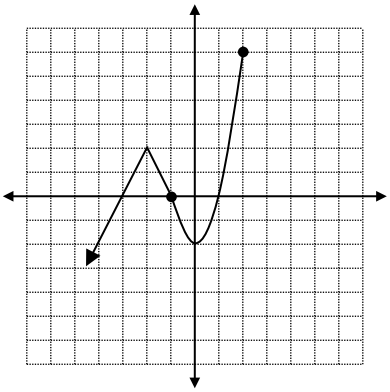


[16-17]

16.



17.



16a) For the interval $[-6, 0]$, state what type of function is represented.

16b) For the interval $[0, \infty)$, state what type of function is represented.

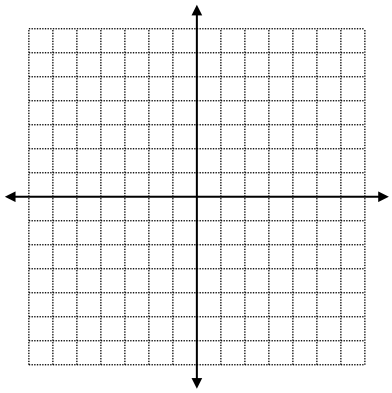
16c) Write the equation for the quadratic function on the interval $[-6, 0]$.

17a) For the interval $(-\infty, -1]$, state what type of function is represented.

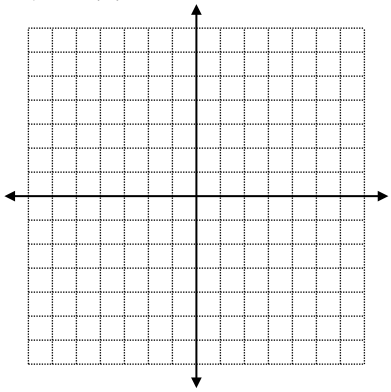
17b) Write the equation for the linear absolute value function on the interval $(-\infty, -1]$.

18. Use the graph from question 16, to graph the following

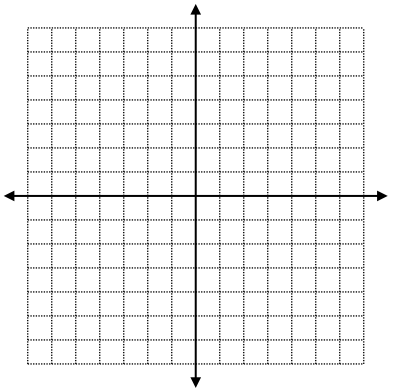
a) $f(x+4)$



b) $-f(x)$

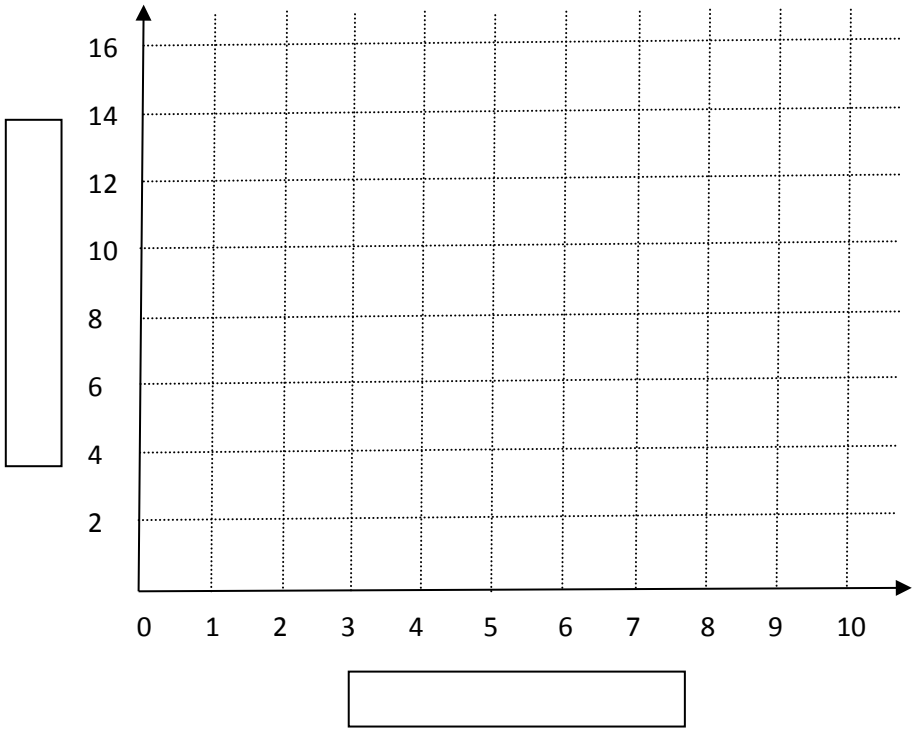


c) $f(-x)$



19. A taxi cab has a flat fee of \$3 plus an additional charge of \$2 per mile or any part of that mile. (For example, a ½ mile travel is \$5 and a 2 ¼ mile travel would be \$9) If $A(x)$ represents the total cost, in dollars, as a function of x, where x is the number of miles traveled and $0 < x \leq 7$,

a) Sketch the graph of $A(x)$ on the set of axes below. Be sure to title each axes appropriately.



b) What is the domain and range of $A(x)$?

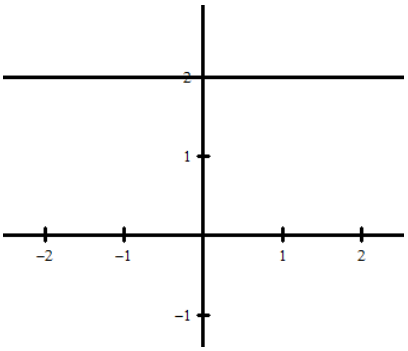
c) Write a piecewise-defined function for $A(x)$, the total cost, on $0 < x \leq 7$.

Math 3 Unit 1 Review Worksheet
Writing Equations from Graphs

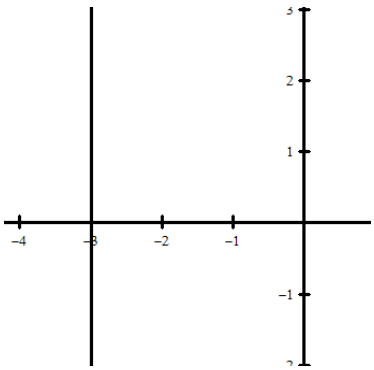
Name:_____
Date:_____ **Per:**_____

[1-10] Write the equation that represents the given graph.

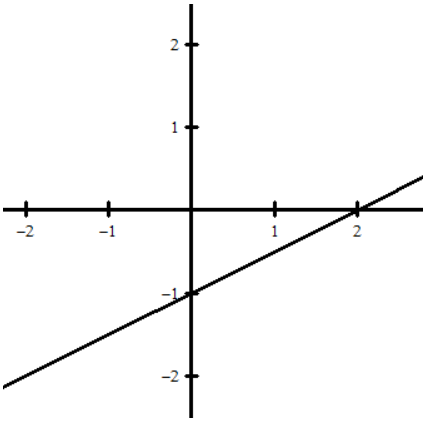
1. Equation_____



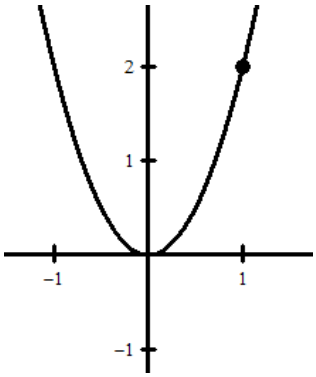
2. Equation_____



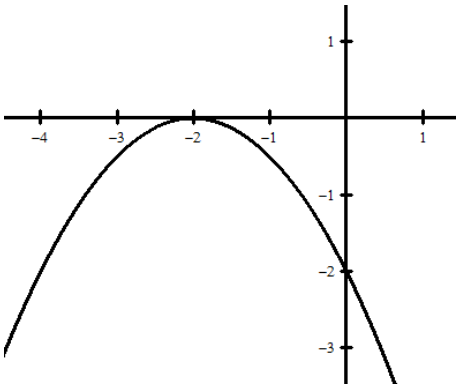
3. Equation_____



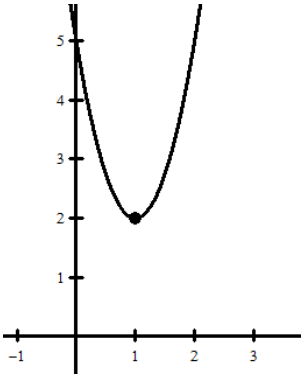
4. Equation_____



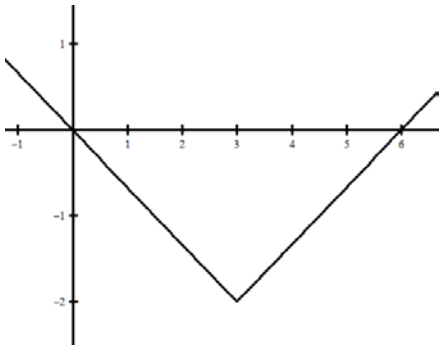
5. Equation_____



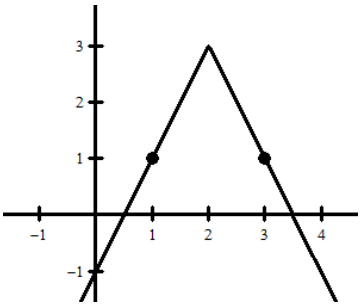
6. Equation_____



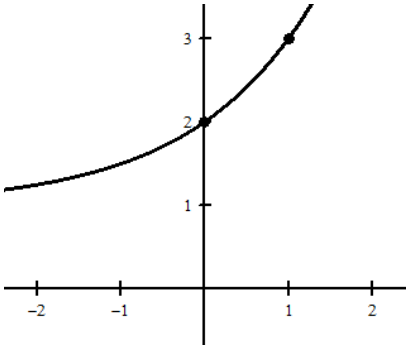
7. Equation_____



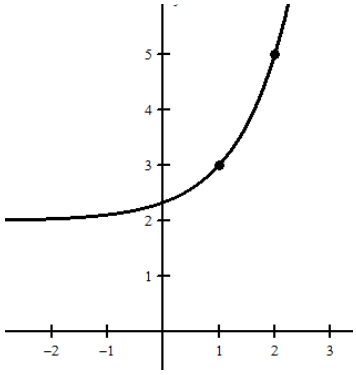
8. Equation_____



9. Equation_____

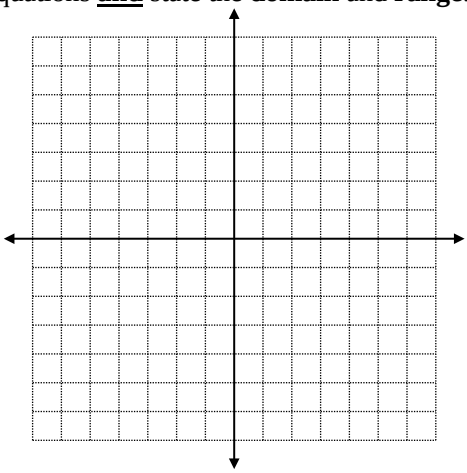


10. Equation_____

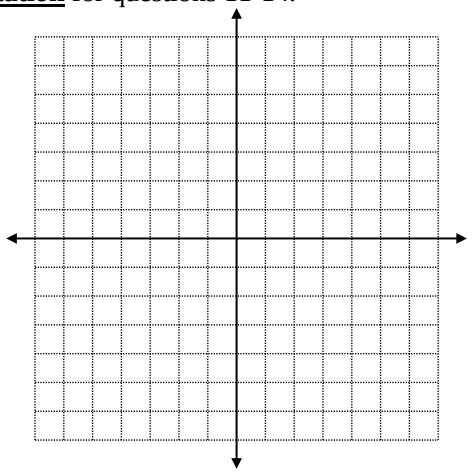


[11-20] Graph the given equations **and** state the **domain** and **range**. Use **inequality notation** for questions 11-14.

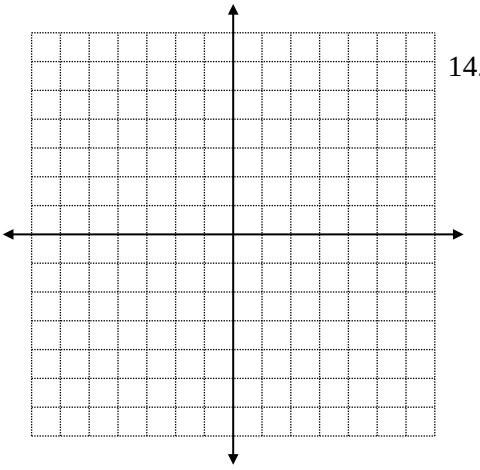
11. $-x + 2y = 0$



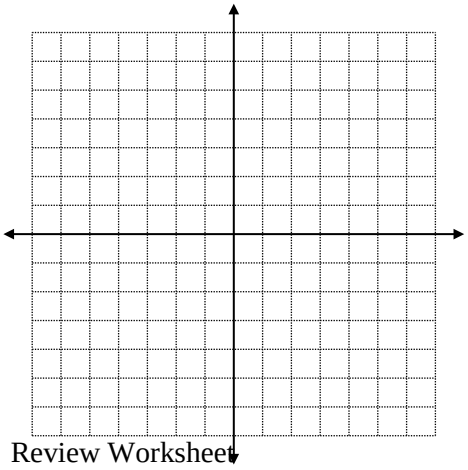
12. $2x + y = 1$



13. $y = -\frac{1}{2}(x-1)^2 + 2$

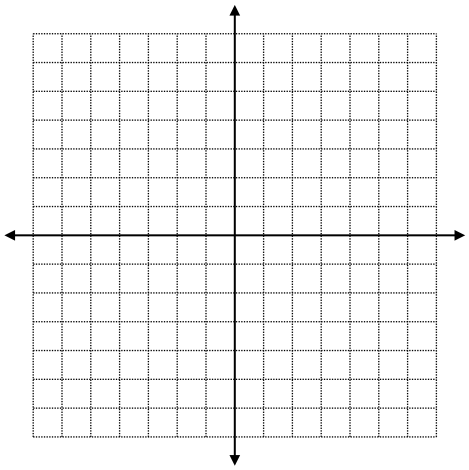


14. $y = 2x^2 - 3$

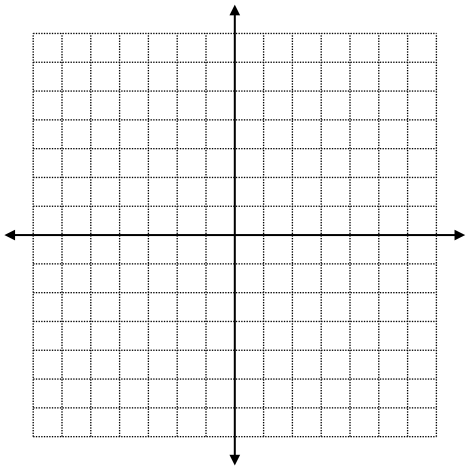


[11-20] Continue graphing the given equations **and** state the **domain** and **range**. Use **interval notation** for questions 15-20.

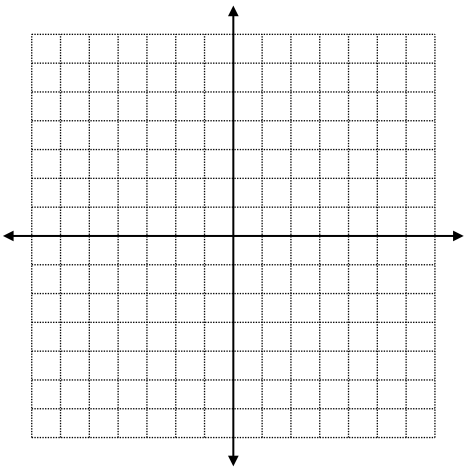
15. $y = 2 - |x + 4|$



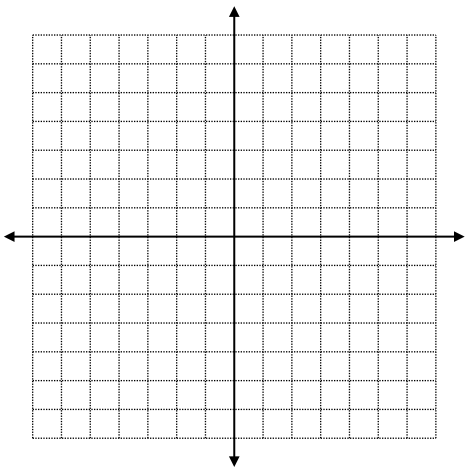
16. $y = 2|x| + 1$



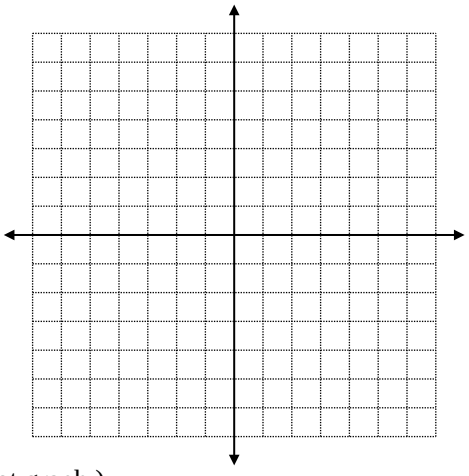
17. $y = 2^{x-1}$



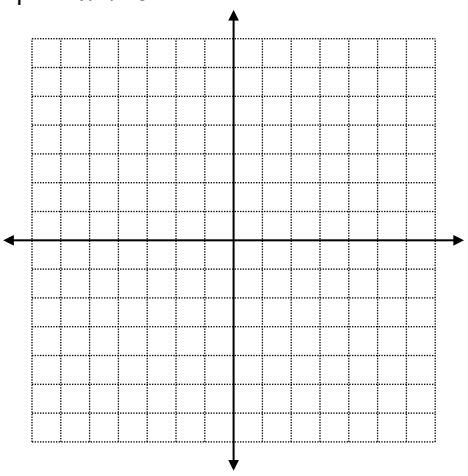
18. $y = 2^{x-2} + 1$



19. $f(x) = 3x$ if $-1 < x \leq 2$



20. . $f(x) = |x + 2|$ if $x \neq 0$



[21-22] Evaluate. (Do not graph.)

21. If $f(x) = \begin{cases} 3 - 2|x + 5| & \text{if } x < -1 \\ 3^{x+2} - 4 & \text{if } x \geq -1 \end{cases}$

find: a) $f(2) =$ ___ b) $f(-2) =$ ___

c) $f(-1) =$ ___

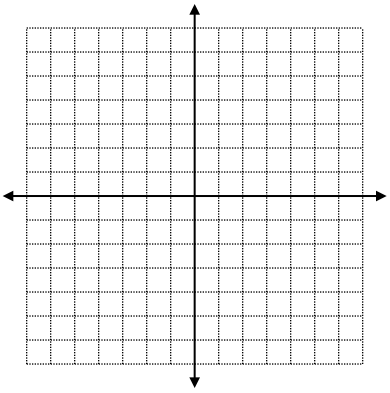
22. If $f(x) = \begin{cases} 4 & \text{if } x < -1 \\ 3 - 2(x-1)^2 & \text{if } -1 \leq x < 2 \\ 3 - \frac{1}{2}x & \text{if } x \geq 2 \end{cases}$

find: a) $g(2) =$ ___ b) $g(-2) =$ ___ c) $g(-1) =$ ___

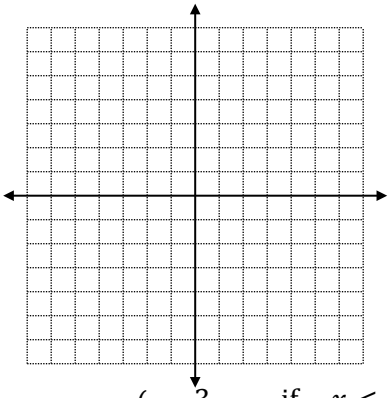
d) $g(1) =$ ___ e) $g(4) =$ ___

[23-26] Graph each of the following, **and** identify the **domain** and the **range** in interval notation.

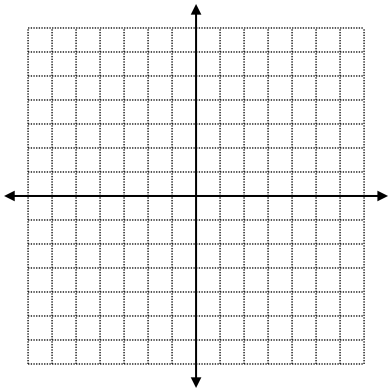
23. $f(x) = \begin{cases} 2 & \text{if } x < 0 \\ -x + 2 & \text{if } x \geq 0 \end{cases}$



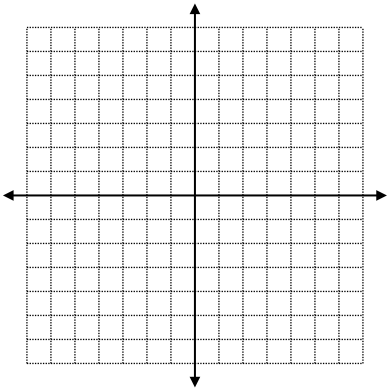
24. $f(x) = \begin{cases} (x-1)^2 & \text{if } x < 3 \\ |x| - 1 & \text{if } x > 3 \end{cases}$



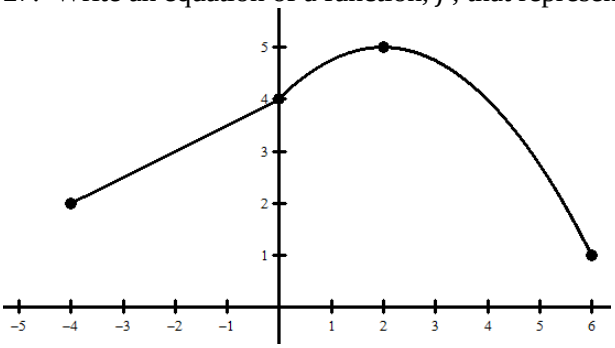
25. $f(x) = \begin{cases} \frac{1}{2}x^2 & \text{if } x \leq 0 \\ 1 & \text{if } 0 < x \leq 3 \\ 2^{x-3} & \text{if } x > 3 \end{cases}$



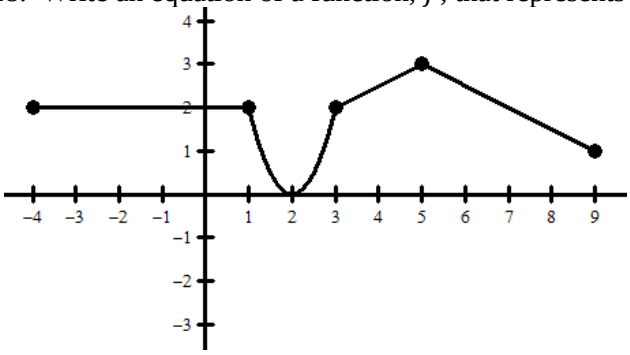
26. $f(x) = \begin{cases} 3 & \text{if } x < -3 \\ x^2 - 2 & \text{if } -3 \leq x \leq 2 \\ x & \text{if } 2 < x < 5 \end{cases}$



27. Write an equation of a function, f, that represents the linear function on the interval $[-4, 0]$.

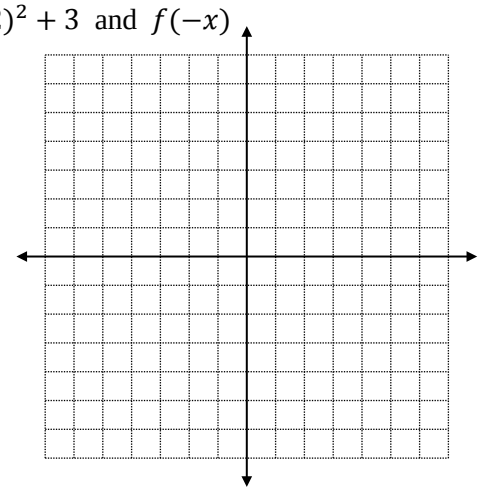


28. Write an equation of a function, f, that represents the linear absolute value function on the interval $[3, 9]$.

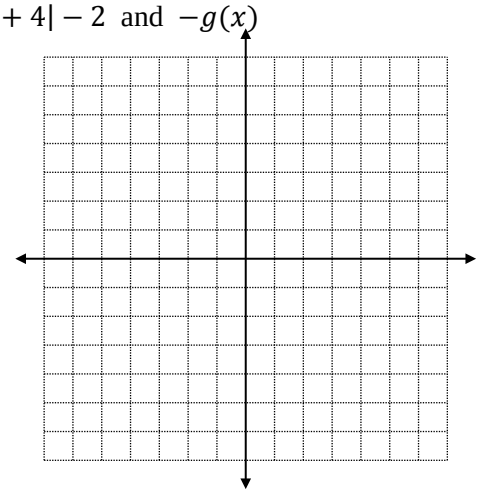


[29-32] Graph the functions below and describe the transformation.

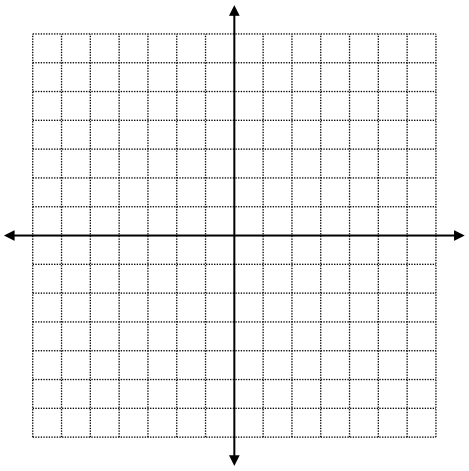
29. $f(x) = (x-2)^2 + 3$ and $f(-x)$



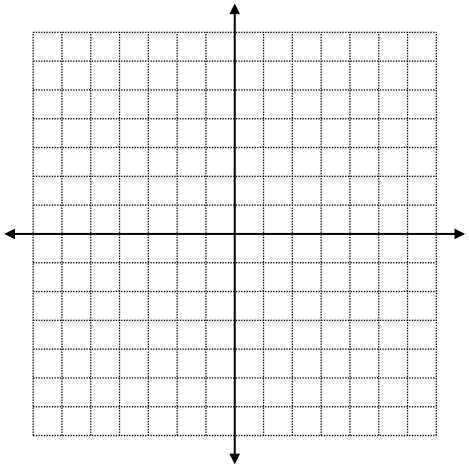
30. $g(x) = -\frac{1}{2}|x+4| - 2$ and $-g(x)$



31. $f(x) = 2^{x+1} - 3$ and $f(x) + 4$

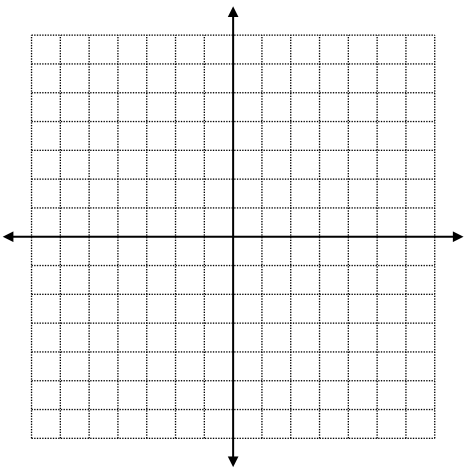


32. $g(x) = 3(x-4) - 2$ and $g(x+3)$

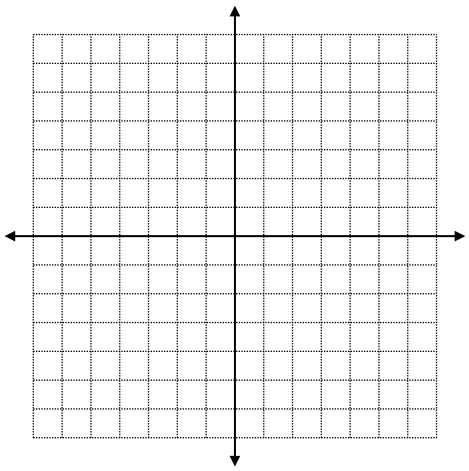


[33-34] Graph the functions below and describe the transformation from $f(x)$ to $g(x)$.

33. $f(x) = 3(x+2)^2 - 1$ and $g(x) = -3(x+4)^2 + 2$



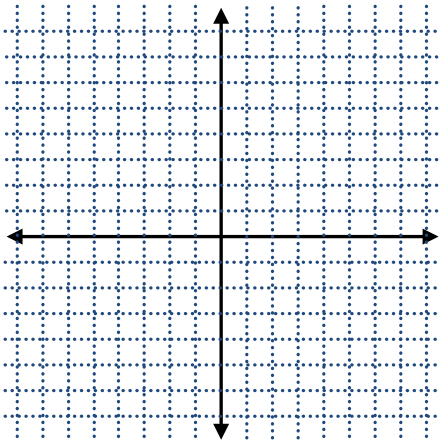
34. $f(x) = -|x| + 3$ and $g(x) = |x+1| - 2$



[35-36]: Find and sketch the composite function, $f(g(x))$ with at least 3 lattice points.

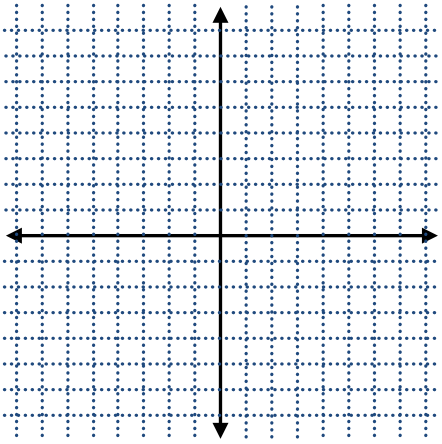
35. $f(x) = 3x^2$; $g(x) = x - 4$

$f(g(x)) =$



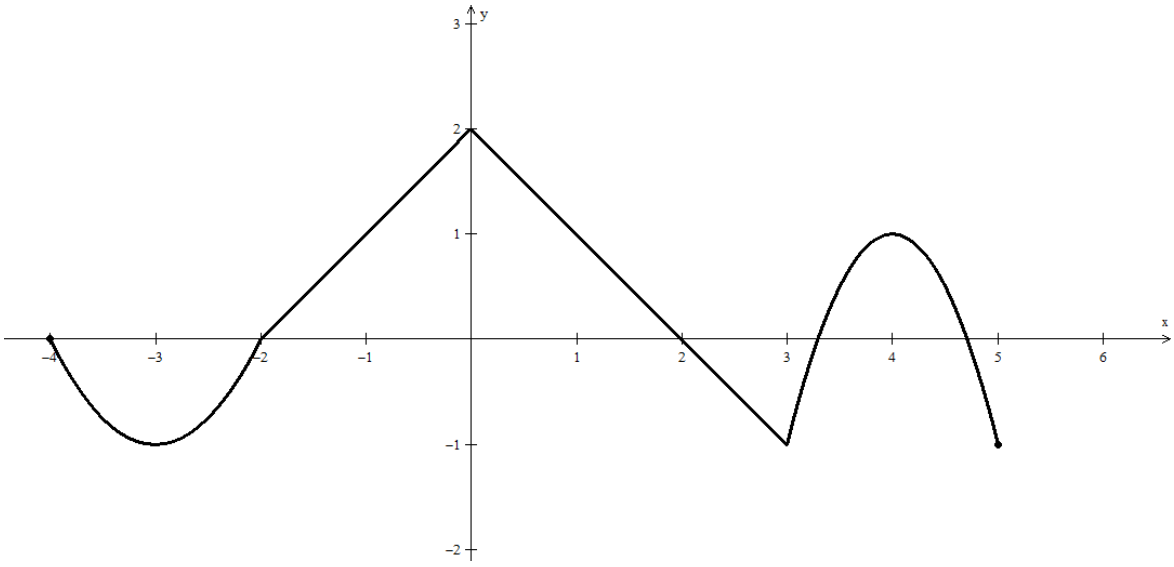
36. $f(x) = \frac{1}{2}|x| + 2$; $g(x) = x - 2$

$f(g(x)) =$



37. For the 3-piece piecewise-defined function below:

a) State the function represented: a linear function, linear absolute value function, or quadratic function on each given interval.



$[-4, -2]$ _____ $[-2, 3]$ _____ $[3, 5]$ _____

b) Write the equation of the function on the interval $[-2, 3]$:_____

$[3, 5]$:_____

38. For $f(x) = \begin{cases} 2^x + 1 & \text{if } x \leq 2 \\ 1 - 3x^2 & \text{if } x > 2 \end{cases}$ find the following:

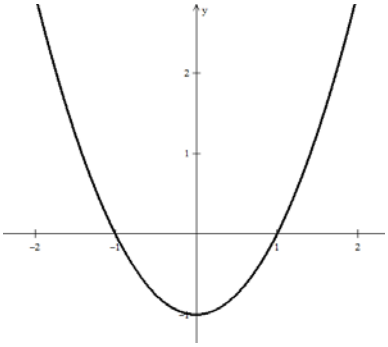
a) $f(3) =$ b) $f(2) =$ c) $f(0) =$

[39-43] Selected Response.

39. For $f(x) = \begin{cases} x^2 + 2 & \text{if } x < 0 \\ -2|x-1| + 3 & \text{if } x \geq 0 \end{cases}$ select all statements that are true.

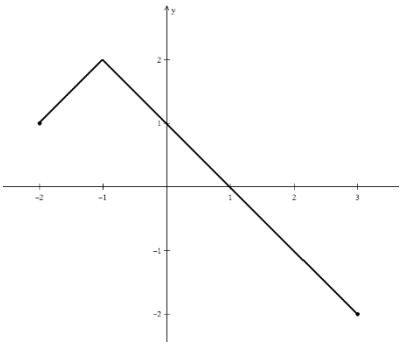
a) $f(3) = -1$ b) $f(2) = 6$ c) $f(0) = 2$ d) $f(0) = 1$ e) $f(-2) = -2$

40. Select all statements that represent the graph below.



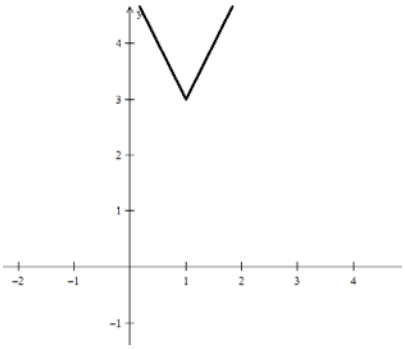
a) $y = (x-1)^2$
b) $y = x^2 - 1$
c) $y = x^2 + 1$
d) $y = (x-1)(x+1)$
e) $y + 1 = (x-0)^2$

41. Select all statements that represent the graph below.



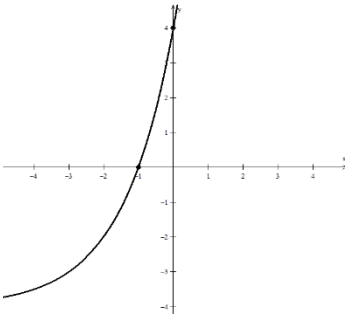
a) $y = -|x+1| - 2$, for $-2 \leq x \leq 3$
b) $y = -|x-1| + 2$, for $x \geq -2$
c) $y = -|x+1| + 2$, for $x \leq 3$
d) $y = -|x+1| + 2$, for $-2 \leq x \leq 3$
e) $y = -|x-1| - 2$, for $-2 \leq x \leq 3$

42. Select all statements that represent the graph below.



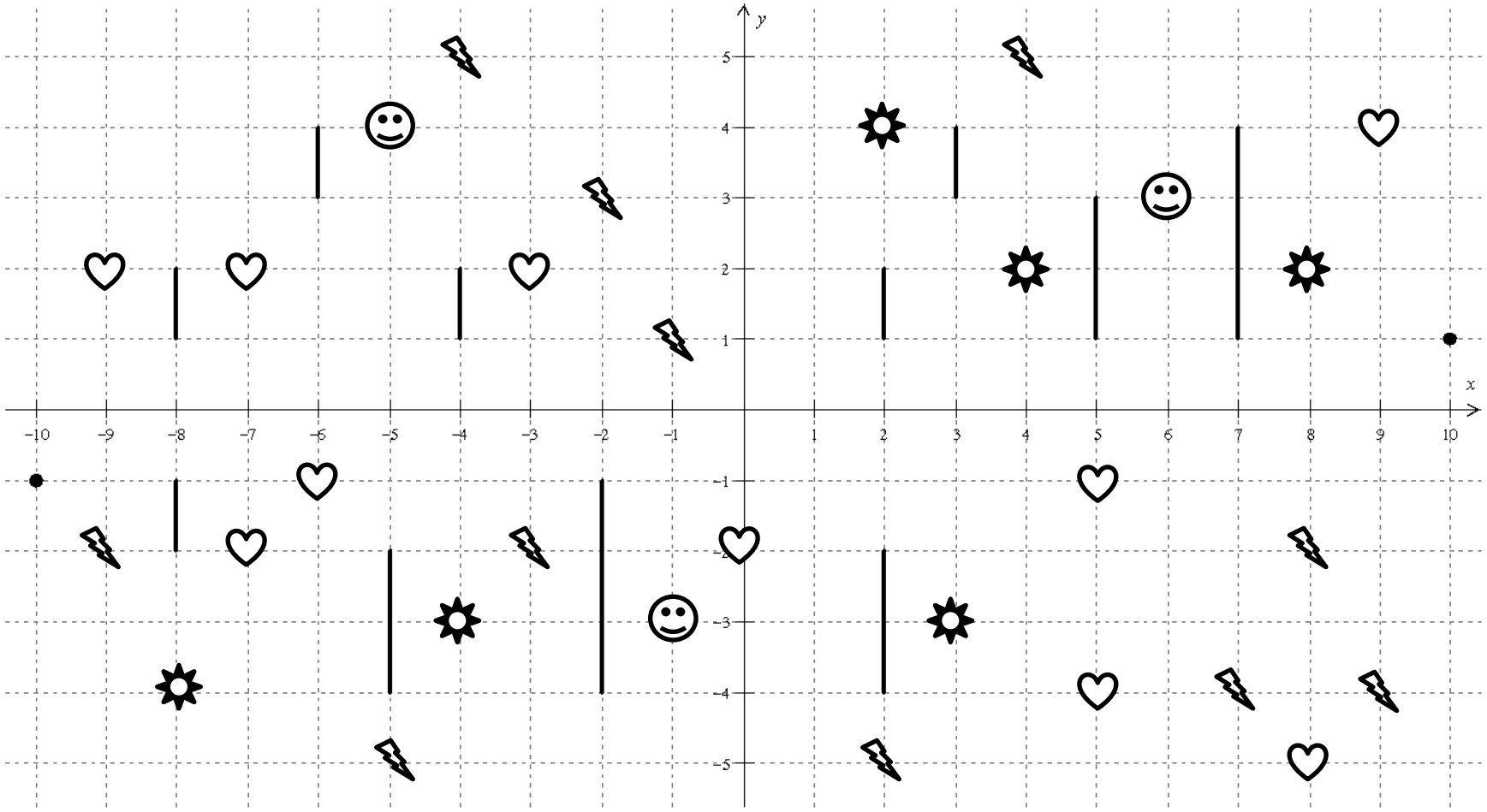
a) $y = 2|x+1| + 3$
b) $y = 2|x-1| - 3$
c) $y = 2|x-1| + 3$
d) $y = 2|x-3| + 1$
e) $y = 2|x-3| - 1$

43. Select all statements that represent the graph below.



a) $y = 2^{x+3} + 4$
b) $y = 2^{x-3} - 4$
c) $y = 2^{x+3} - 4$

Math 3 Unit 1 Piecewise Function Challenge Map



Map key

= wall (cannot pass through any points on the line segment) = 40 pts = 30 pts = 20 pts = 10 pts

Linear piece = -15 points Absolute value piece = -10 points Quadratic piece = - 5points Exponential piece = - 1 point

Math 3 Unit 1 Piecewise Function Challenge **Names**_____

_____

Directions

Create a piecewise function that begins at the indicated point$(-10,-1)$ and ends at the indicated point $(10,1)$ and is continuous on $-10 \leq x \leq 10$. Try to pass through the reward symbols ( ,  ,  , and )

which lie on lattice points with integer coordinates to earn points while spending points using linear, absolute value, quadratic, and exponential pieces. For each reward symbol your function passes through, highlight it using a highlighter on the graph of your piecewise function and complete the table below to verify that your function indeed passes through the integer coordinates of the reward symbol. If two different pieces of your piecewise function connect at a reward symbol, you must verify that both pieces pass through the coordinates of that reward symbol.

Reward Symbol	**Coordinates of Reward Symbol**	**Corresponding Piece of the Function**	**Show the work that verifies the corresponding piece passes through the coordinates of the reward symbol**

Computing the Cumulative Points Earned and Spent by your piecewise function

Reward Symbol	Number Earned		Points Earned Per Symbol		Point Subtotals
		x	40	=	
		x	30	=	
		x	20	=	
		x	10	=	
Type of Function	**Number Used**				
Linear		x	(-15)	=	
Absolute Value		x	(-10)	=	
Quadratic		x	(-5)	=	
Exponential		x	(-1)	=	
				+	
			Total Points	=	

THE FOLLOWING TWO SECTIONS WILL BE COMPLETED BY YOUR MATH 3 TEACHER ONLY

Formula for Percent Accuracy of Graph and Equation of your Piecewise Function

		Number of pieces
	x 4	
		Subtotal
–		Number of errors
		Total
÷		Subtotal from line 3
	x 100	
		Percent Accuracy

Grading Rubric

Total Points	x (0.5)	
Percent Accuracy	x (0.5)	
	+	
	Grade (out of possible 100 points)	