Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
PIECEWISE FUNCTIONS	

EVALUATING
Piecewise Functions

1. Given $f(x)=\begin{cases} x^2-1 & \text{if } x<-2 \\ 5x+3 & \text{if } x\ge -2 \end{cases}$, find each value.

a) $f(-5)$ **b)** $f(-2)$ **c)** $f(7)$

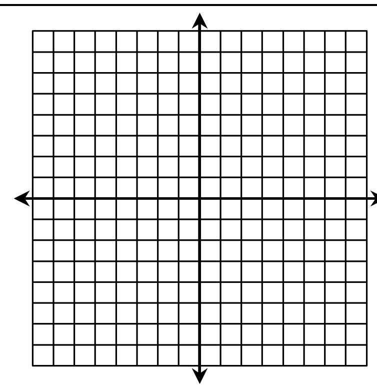
2. Given $g(x)=\begin{cases} \frac{1}{2}x+3 & \text{if } x\le -4 \\ -x-1 & \text{if } -4<x<1 \\ 2x^3+9 & \text{if } x\ge 1 \end{cases}$, find each value.

a) $g(2)$ **b)** $g(-1)$ **c)** $g(-6)$

GRAPHING
Piecewise Functions

Graph each piecewise function, then identify the domain and range.

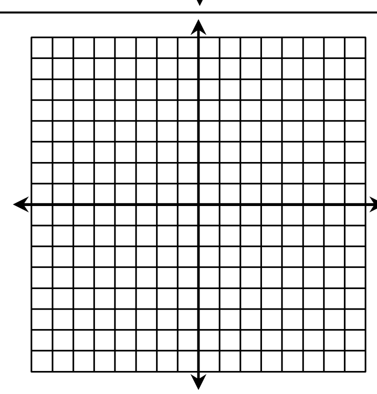
3. $f(x)=\begin{cases} x & \text{if } x\le -3 \\ -2x+1 & \text{if } x>-3 \end{cases}$



D = ______________________

R = ______________________

4. $g(x)=\begin{cases} -3x-7 & \text{if } x<-1 \\ -5 & \text{if } x\ge -1 \end{cases}$



D = ______________________

R = ______________________

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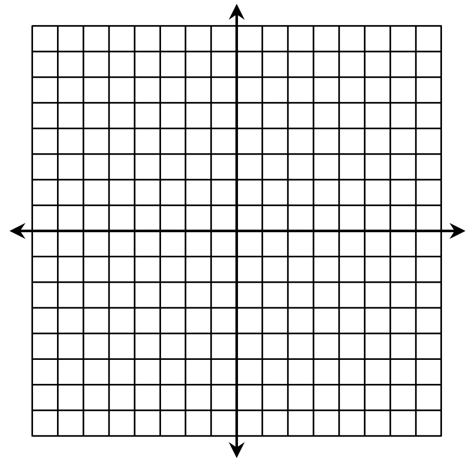
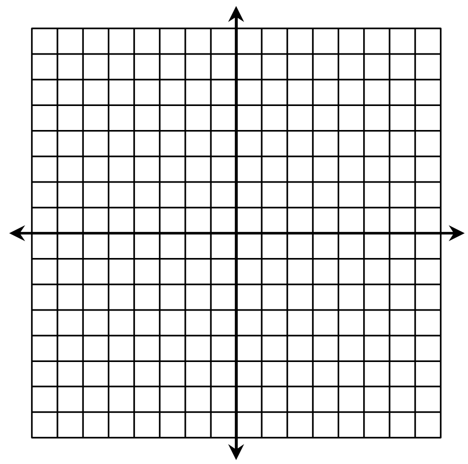
5. $g(x)=\begin{cases}-\dfrac{5}{2}x-1 \text{ if } x<2\\ x+2 \text{ if } x>2\end{cases}$



D = ______________________

R = ______________________

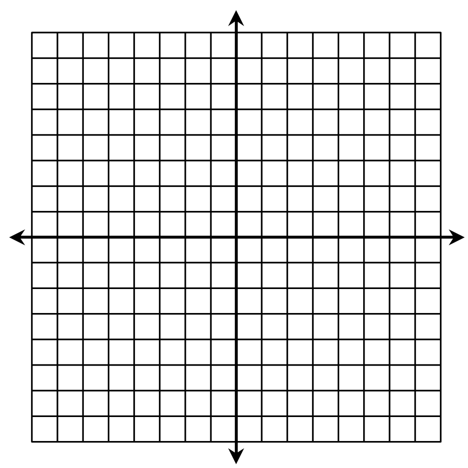
6. $g(x)=\begin{cases}-1 \text{ if } x\le -5\\ -x-3 \text{ if } -5<x<1\\ 6 \text{ if } x\ge 1\end{cases}$



D = ______________________

R = ______________________

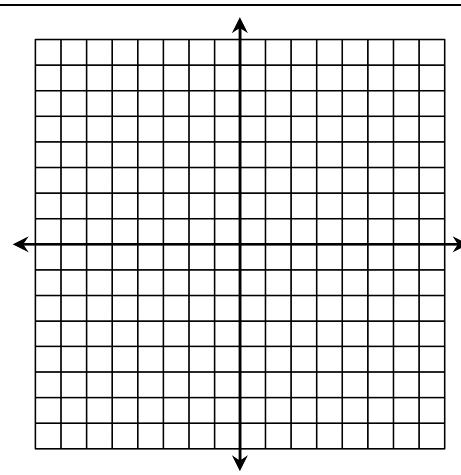
7. $f(x)=\begin{cases}2x \text{ if } x\le -2\\ -1-x \text{ if } -2<x<4\\ -3 \text{ if } x\ge 4\end{cases}$



D = ______________________

R = ______________________

8. $h(x)=\begin{cases}-3x \text{ if } x<0\\ -\dfrac{1}{2}x-1 \text{ if } 0\le x<6\\ x-7 \text{ if } x>6\end{cases}$



D = ______________________

R = ______________________

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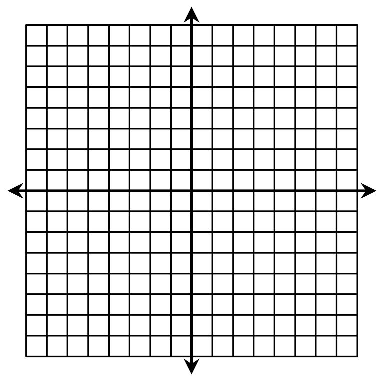
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
ABSOLUTE VALUE *Functions*	• The **absolute value function** is written as ________________

- Complete the table below to graph the function. Give the domain and range.

x	$\lvert x \rvert$
-3	
-2	
-1	
0	
1	
2	
3	



D = ________________

R = ________________

- The **graph** looks like a _______; The **turning point** is called the ___________.

GRAPHING *by Table*

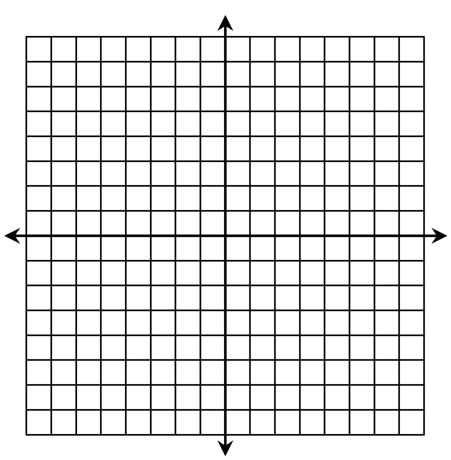
To create a table of values, it's best to place the vertex in the middle, then include values on both sides.

1	Find the **x-value of the vertex.** Set the expression from the inside of the absolute value bars equal to 0 and solve.
2	**PLACE THIS VALUE IN THE MIDDLE ROW OF YOUR TABLE**. Number up and down, then complete the table.
3	**GRAPH!**

Directions: Graph each function. Give the domain and range.

1. $f(x) = |x - 4|$

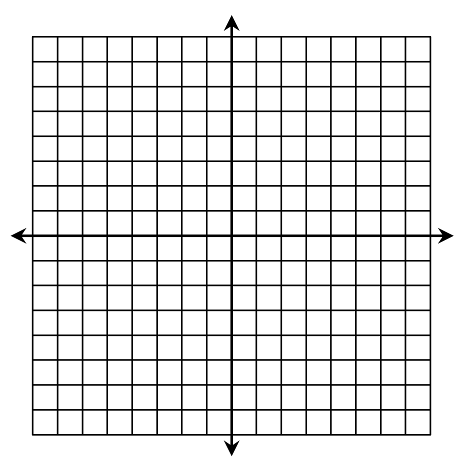
x	$f(x)$



D = ________________ R = ________________

2. $f(x) = |2x + 6|$

x	$f(x)$



D = ________________ R = ________________

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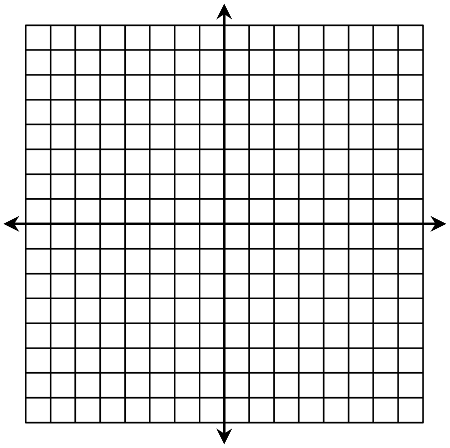
3. $f(x) = |x| + 5$

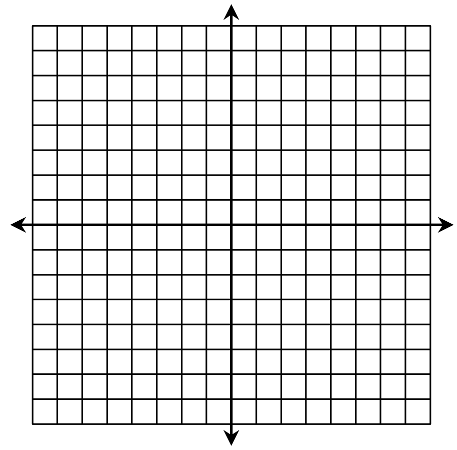
x	$f(x)$



D = ________________ R = ________________

4. $f(x) = |3x + 2|$

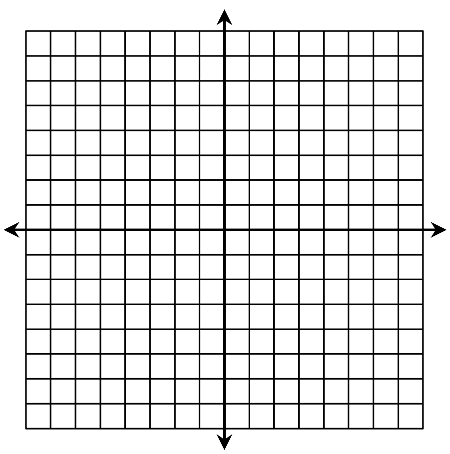
x	$f(x)$



D = ________________ R = ________________

5. $f(x) = -|x + 1|$

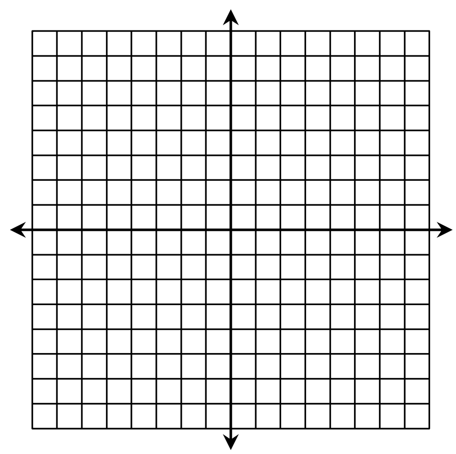
x	$f(x)$



D = ________________ R = ________________

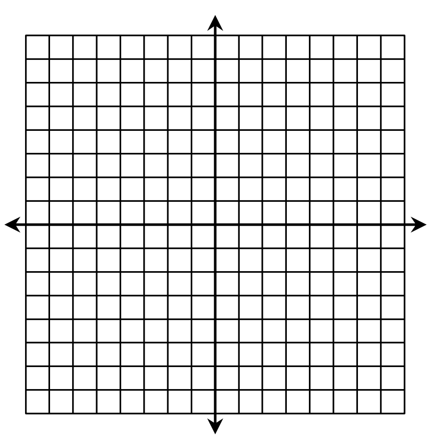
6. $f(x) = \left|\frac{1}{2}x + 1\right| - 4$

x	$f(x)$



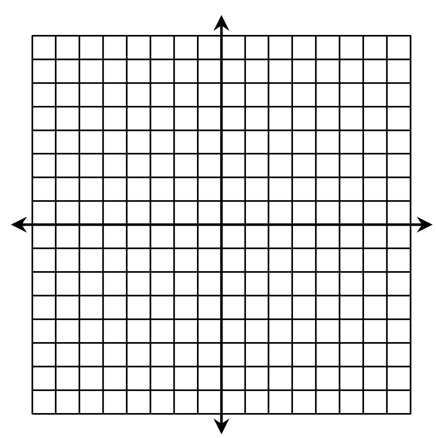
D = ________________ R = ________________

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



D = ________________ R = ________________

8. $f(x) = \begin{cases} |2x| - 4 & \text{if } x \leq -3 \\ -5 & \text{if } -3 < x < 2 \\ x - 2 & \text{if } x \geq 2 \end{cases}$



D = ________________ R = ________________

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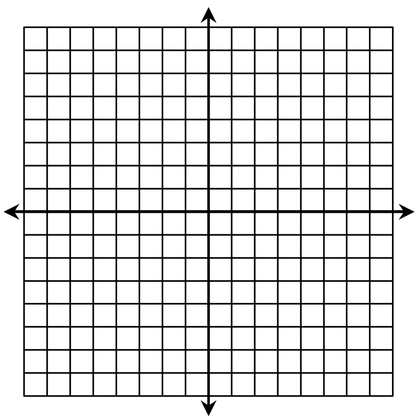
Name:	Date:
Topic:	**Class:**

Main Ideas/Questions	Notes/Examples	
GRAPHING ABSOLUTE VALUE *inequalities*	1	Create a **TABLE OF VALUES.** Recall that the vertex should be in the middle row.
	2	**GRAPH!** Use a dashed line for < and > symbols and a solid line for ≤ and ≥ symbols.
	3	**SHADE!** Assuming y is to the left, shade above the line for > or ≥ symbols and below the line for < or ≤ symbols.

Directions: Graph each inequality.

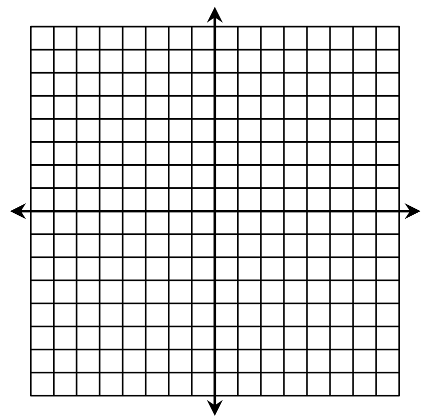
1. $y < |x+1|$

x	y



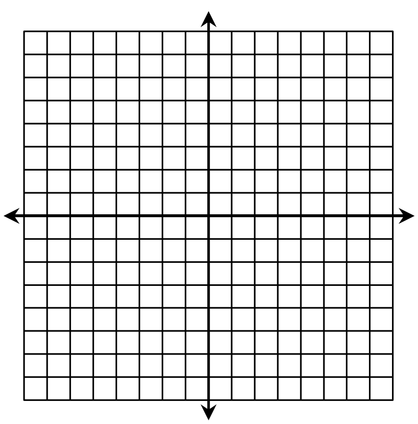
2. $y \geq |x-5|-2$

x	y



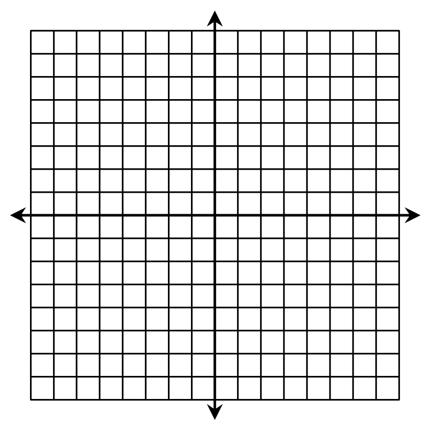
3. $y > |4x+6|$

x	y



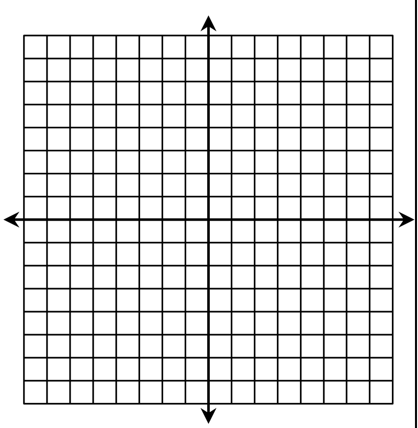
4. $y \leq -|2x|+3$

x	y



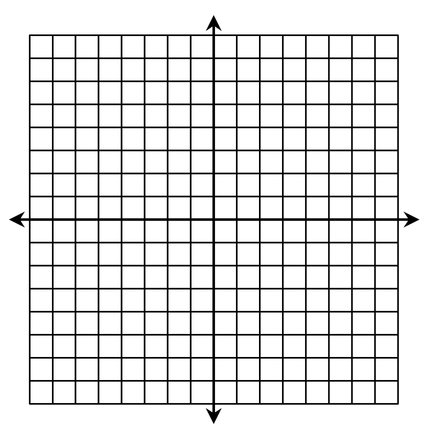
5. $y \geq |2x-12|-7$

x	y



6. $y < -|3x+9|+4$

x	y



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Name:	**Date:**
Topic:	**Class:**

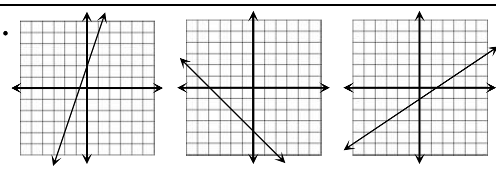
Main Ideas/Questions	Notes/Examples

FUNCTION FAMILY

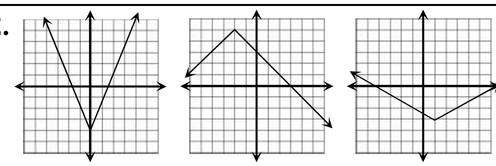
A **family of functions** (or function family) is a set a functions whose equations and graphs have a similar form and shape.

Name the function family for each set of graphs.

1.



2.

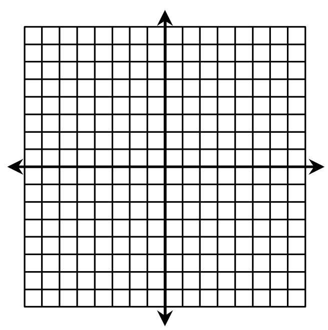


PARENT FUNCTION

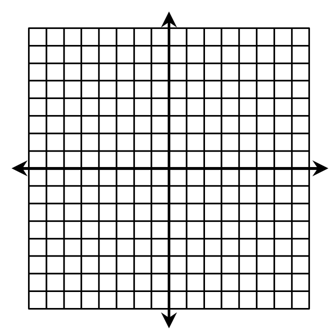
A **parent function** is the simplest function of the family.

Give the parent function for each function family. Then graph the function.

LINEAR: ____________



ABSOLUTE VALUE: ____________



TRANFORMATIONS

A **transformation** changes the position or size of a figure. Transformations can be applied to parent functions.

Let's use the absolute value function as an example. Using your calculator, graph the following functions, then compare to the parent function. Give a brief description.

3. $f(x) = \lvert x+2 \rvert$	**4.** $f(x) = \lvert x-2 \rvert$
5. $f(x) = \lvert x \rvert + 2$	**6.** $f(x) = \lvert x \rvert - 2$
7. $f(x) = 2\lvert x \rvert$	**8.** $f(x) = \frac{1}{2}\lvert x \rvert$
9. $f(x) = -\lvert x \rvert$	

Types of TRANSFORMATIONS

- A ______________________________ slides (or shifts) a function.
- A ______________________________ stretches or compresses a function.
- A ______________________________ flips a function.

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TRANSFORMATION Rules	We can tell from the function which transformation(s) from the parent function have taken place using the following rules:	
	TRANSLATIONS	$f(x+h)$
		$f(x-h)$
		$f(x)+k$
		$f(x)-k$
	DILATIONS	$a \cdot f(x)$ (when $\lvert a \rvert > 1$)
		$a \cdot f(x)$ (when $\lvert a \rvert < 1$)
	REFLECTIONS	$-f(x)$

IDENTIFYING Transformations	**Describe how the following functions compare to the parent function.**	
	10. $f(x)=\lvert x\rvert-3$	**11.** $f(x)=\lvert x+7\rvert$
	12. $f(x)=-\lvert x-4\rvert$	**13.** $f(x)=4\lvert x\rvert+1$
	14. $f(x)=\frac{1}{3}\lvert x\rvert$	**15.** $f(x)=\lvert x+2\rvert-5$
	16. $f(x)=-2\lvert x-1\rvert$	**17.** $f(x)=\frac{4}{3}\lvert x\rvert+2$

WRITING Functions	**Transformations to the absolute value parent function are described. Write the new function.**	
	18. Translated 6 units right.	
	19. Reflected in the x-axis, then translated 2 units up.	
	20. Vertically stretched by a factor of 5, then translated 1 unit left.	
	21. Translated 3 units right and 4 units down.	
	22. Vertically compresssed by a factor of 2/3, then reflected in the x-axis.	
	23. Vertically stretched by a factor of 2, then translated 9 units down.	
	24. Vertically compressed by a factor of 1/4, then shifted 1 unit left.	

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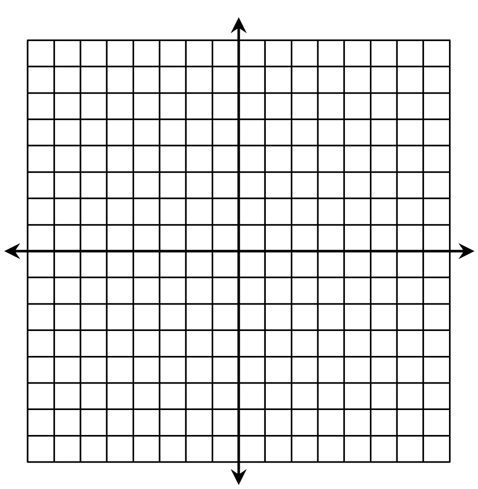
Name:	Date:
Topic:	Class:

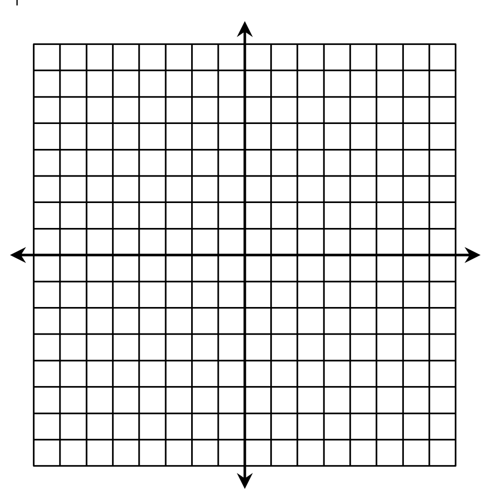
Main Ideas/Questions	Notes/Examples
WARM-UP	**1.** What is the parent function of the absolute value function family? **2.** Describe how the following functions compare to the parent function: **a)** $f(x)=\lvert x-5\rvert$ **b)** $f(x)=\lvert x\rvert+9$ **c)** $f(x)=-\lvert x\rvert$ **d)** $f(x)=3\lvert x\rvert-2$ **e)** $f(x)=\frac{1}{4}\lvert x+6\rvert$ **f)** $f(x)=-\lvert x+7\rvert-2$
	The **horizontal** and **vertical shifts** describe the **location of the vertex!**
VERTEX FORM of an Absolute Value Function	The **vertex form** of an **absolute value function** is written as where _______________ is the **vertex**, _______ is the **slope on the right side** and ________ is the **slope on the left side**

Directions: Give the vertex of each absolute value function. Then graph.

1. $f(x)=\lvert x-2\rvert-4$



2. $f(x)=3\lvert x+5\rvert$



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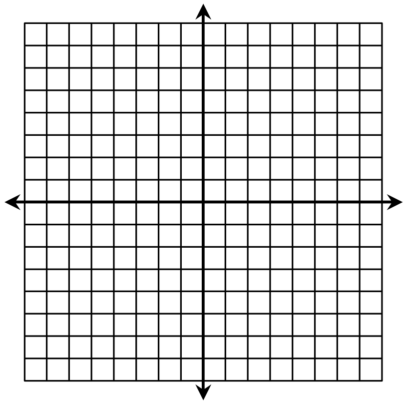
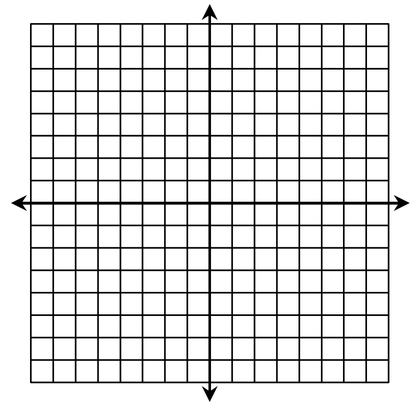
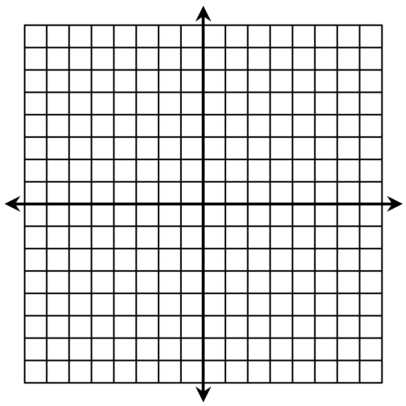
3. $f(x)=2|x+1|-2$



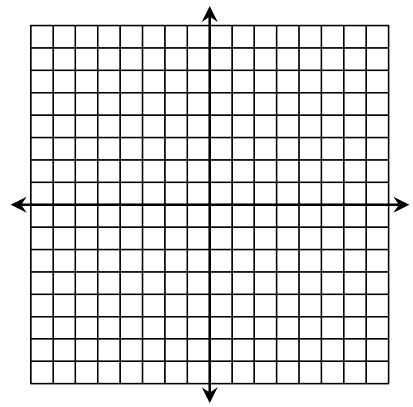
4. $f(x)=-|x-6|$



5. $f(x)=\frac{2}{3}|x+1|-1$

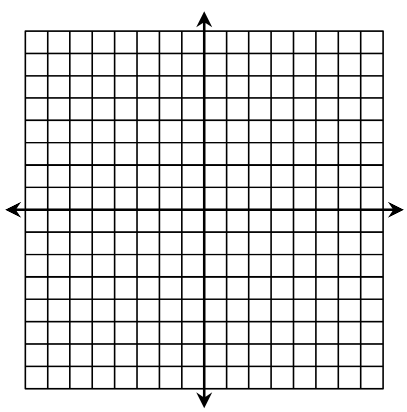


6. $f(x)=-\frac{3}{4}|x|+7$

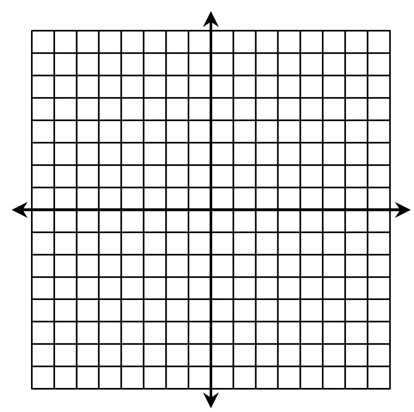


Directions: Graph each piecewise function.

7. $f(x)=\begin{cases} 2x+7 & \text{if } x<-4 \\ 2|x+3| & \text{if } x\geq -4 \end{cases}$

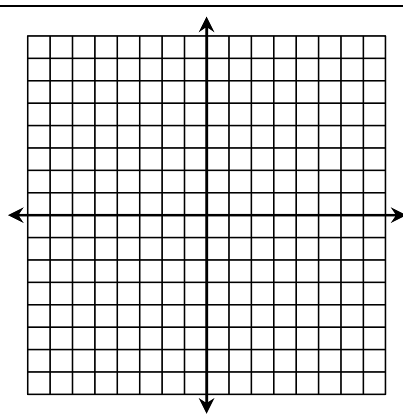


8. $f(x)=\begin{cases} -|x+1|+5 & \text{if } x\leq -4 \\ 3 & \text{if } -4<x<2 \\ -x+7 & \text{if } x\geq 2 \end{cases}$

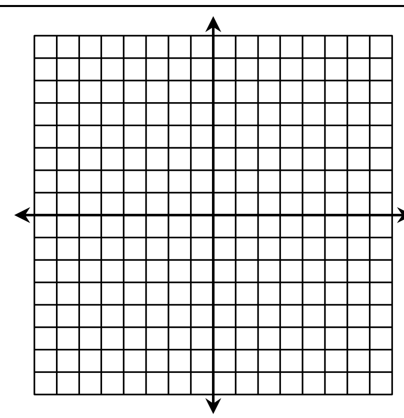


Directions: Graph each absolute value inequality by identifying the vertex.

9. $y\leq |x+4|-6$



10. $y>-2|x-5|+4$



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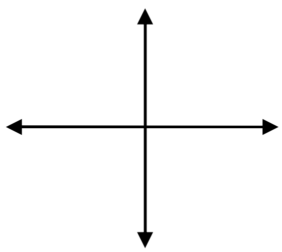
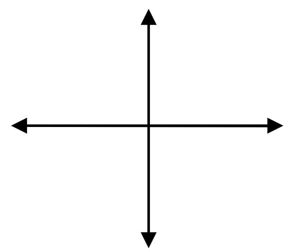
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
QUADRATIC FUNCTION	• **Standard Form of a Quadratic Equation:** ________________ • A quadratic equation creates a **U-shaped curve** called a **parabola.**
Examples	**Using your graphing calculator, sketch the following functions:** $f(x) = x^2 + 2x - 5$  $f(x) = -x^2 + 3x + 7$  If **"a" is positive**, then the parabola will **open up**. If **"a" is negative**, then the parabola will **open down**.
Parts of a **PARABOLA**	• The **vertical line** that divides the parabola into two equal parts is called the **axis of symmetry.** • **Axis of Symmetry Formula:** ________________ • The **turning point** of the parabola is called the **vertex.** When the vertex is the lowest point, it's called a **minimum**, when it's the highest point, it's called a **maximum.** • **Label these parts on the graphs above.**

Directions: Determine whether each function has a minimum or maximum. Then find the axis of symmetry and vertex.

1. $f(x) = 4x^2$

Minimum / Maximum

Axis of Symmetry: ________

Vertex: ________

2. $f(x) = -x^2 + 6x$

Minimum / Maximum

Axis of Symmetry: ________

Vertex: ________

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

Minimum / Maximum

Axis of Symmetry: ________

Vertex: ________

4. $f(x) = x^2 - 8x + 9$

Minimum / Maximum

Axis of Symmetry: ________

Vertex: ________

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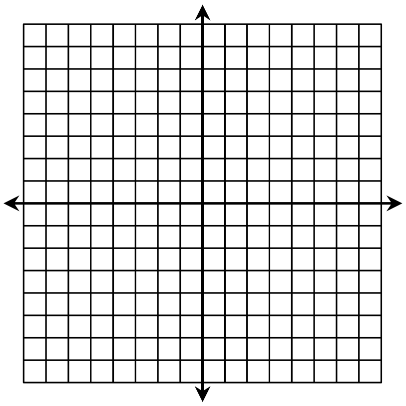
GRAPHING
by Table

①	Find the **AXIS OF SYMMETRY** and **VERTEX**.
②	**PLACE THE VERTEX AS THE MIDDLE ROW.** Number up and down, then complete the table.
③	**GRAPH!**

Directions: Graph each function. State the domain and range.

5. $f(x) = -3x^2$

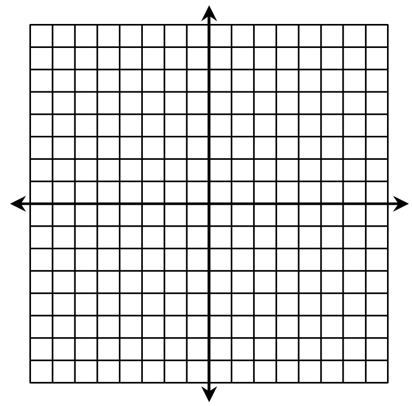
x	$f(x)$



$D =$ ____________________ $R =$ ____________________

6. $f(x) = x^2 - 6x + 11$

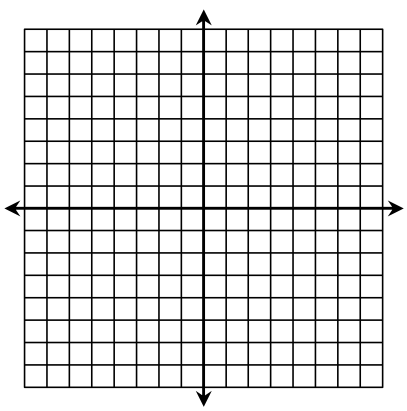
x	$f(x)$



$D =$ ____________________ $R =$ ____________________

7. $f(x) = 2x^2 - 8x + 6$

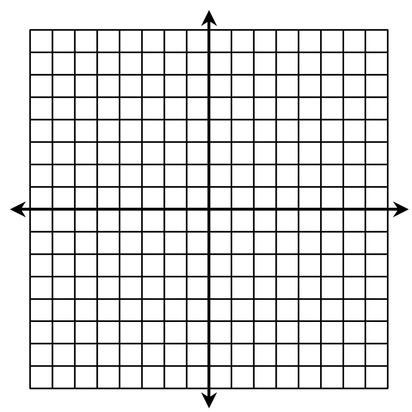
x	$f(x)$



$D =$ ____________________ $R =$ ____________________

8. $f(x) = -x^2 + 5$

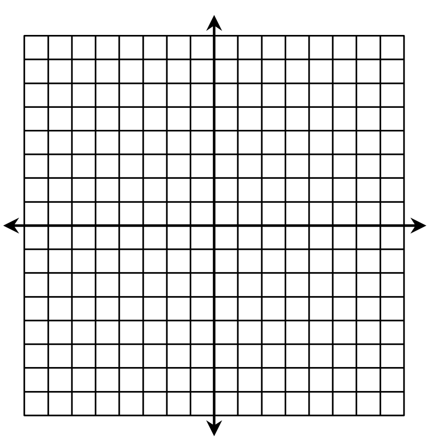
x	$f(x)$



$D =$ ____________________ $R =$ ____________________

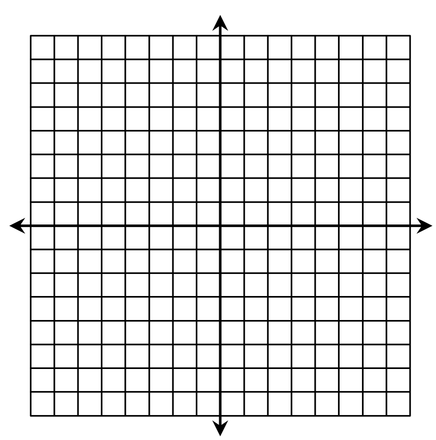
9. $f(x) = -\dfrac{1}{2}x^2 - x$

x	$f(x)$



$D =$ ____________________ $R =$ ____________________

10. $f(x) = \begin{cases} 2x + 5 & \text{if } x < -4 \\ x^2 + 3x & \text{if } x \ge -4 \end{cases}$



$D =$ ____________________ $R =$ ____________________

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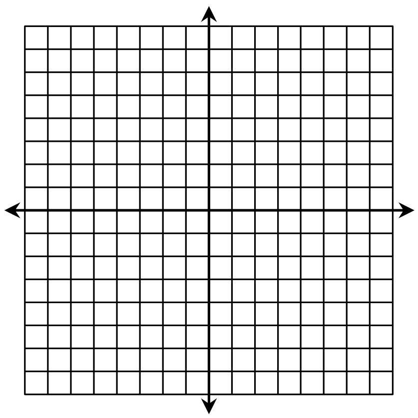
Name:	**Date:**
Topic:	**Class:**

Main Ideas/Questions	Notes/Examples	
GRAPHING QUADRATIC *inequalities*	①	Create a **TABLE OF VALUES.** Recall that the vertex should be in the middle row.
	②	**GRAPH!** Use a dashed line for < and > symbols and a solid line for ≤ and ≥ symbols.
	③	**SHADE!** Assuming y is to the left, shade above the line for > or ≥ symbols and below the line for < or ≤ symbols.

Directions: Graph each inequality.

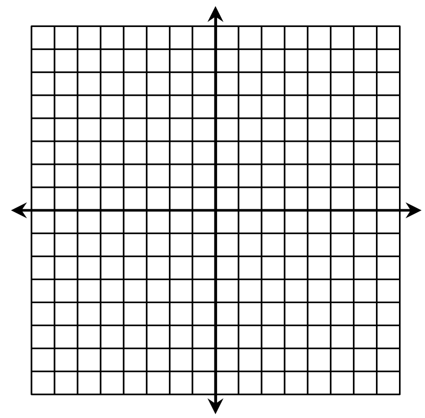
1. $y > x^2 + 2x - 2$

x	y



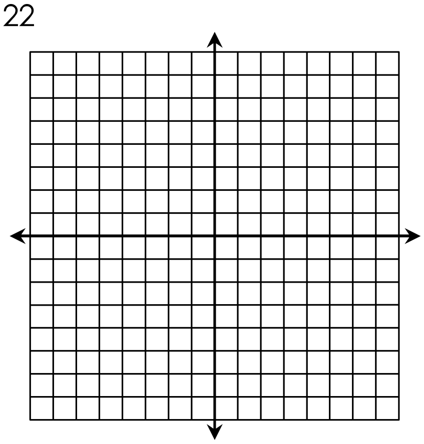
2. $y \le -x^2 + 4x - 1$

x	y



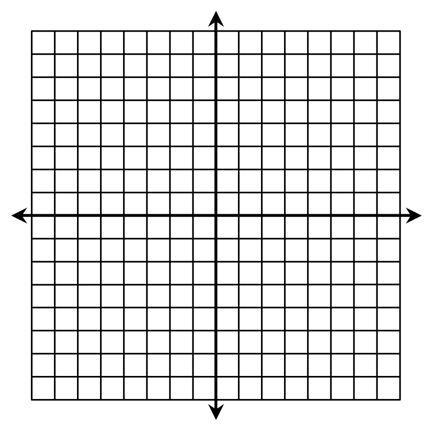
3. $y \ge -3x^2 + 18x - 22$

x	y



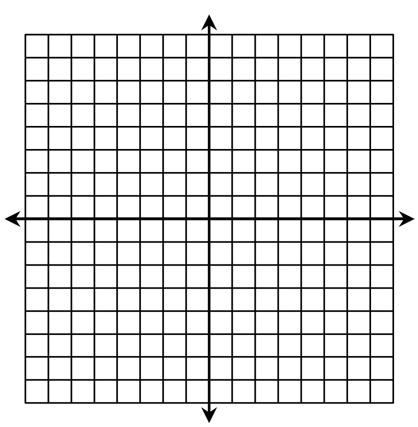
4. $y < x^2 + 6$

x	y



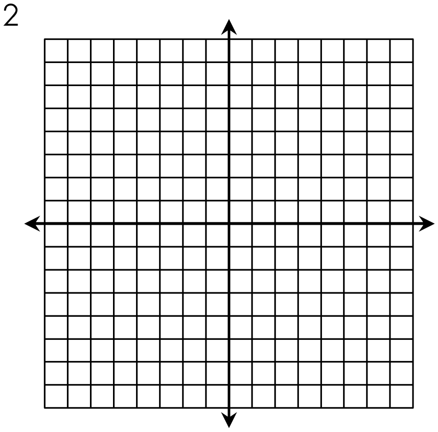
5. $y \le -2x^2 - 2x$

x	y



6. $y > \frac{1}{2}x^2 - 4x + 12$

x	y



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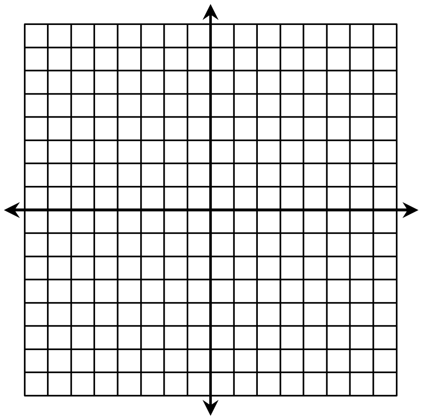
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
VERTEX FORM *of a Quadratic Function*	• **Vertex Form** of a **Quadratic Equation**: ______________________________ • ______________ is the **vertex;** ____________ is the **axis of symmetry** • ______ determines the **width and direction of the parabola**
WHY USE *Vertex Form?*	Vertex form shows the ___________________________on a quadratic equation in respect to its parent function, __________________.
TRANSFORMATIONS *from the Parent Function*	**Describe how each function compares to the parent function.** **1)** $f(x) = x^2 + 9$ **2)** $f(x) = x^2 - 2$ **3)** $f(x) = -(x+5)^2$ **4)** $f(x) = (x-4)^2 - 1$ **5)** $f(x) = \frac{1}{3}x^2 + 2$ **6)** $f(x) = -2(x+4)^2$ **7)** Mason graphed the parent function of a quadratic equation. Then, he reflected the parabola over the x-axis, and translated it seven units up and three units to the right. What is the equation of the new parabola?

Directions: Give the vertex and axis of symmetry of each quadratic function. Then graph.

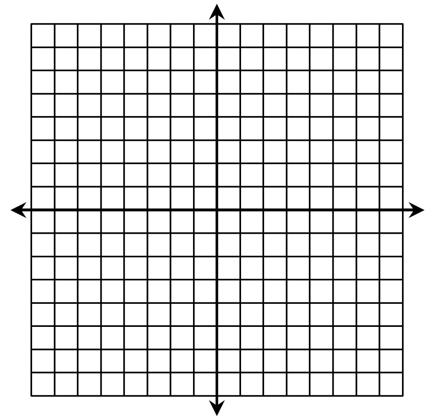
8. $f(x) = (x-2)^2 + 3$

x	$f(x)$



9. $f(x) = x^2 - 4$

x	$f(x)$



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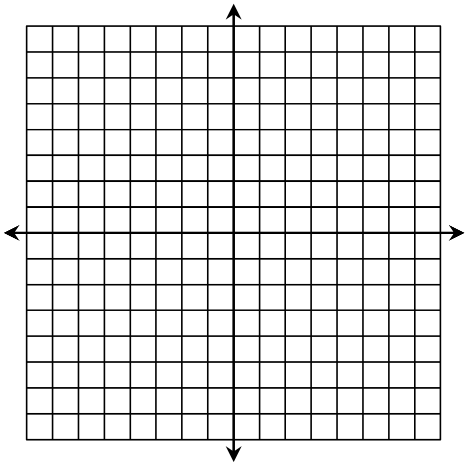
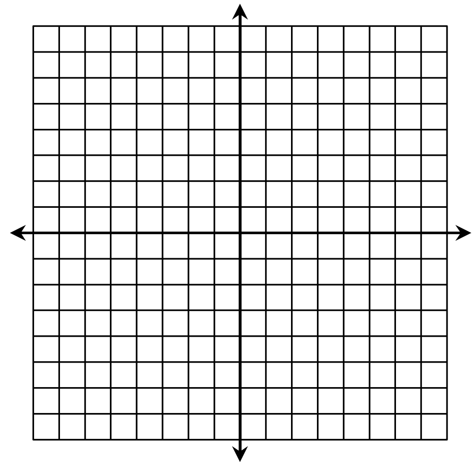
10. $f(x) = -(x+5)^2 - 1$

x	$f(x)$



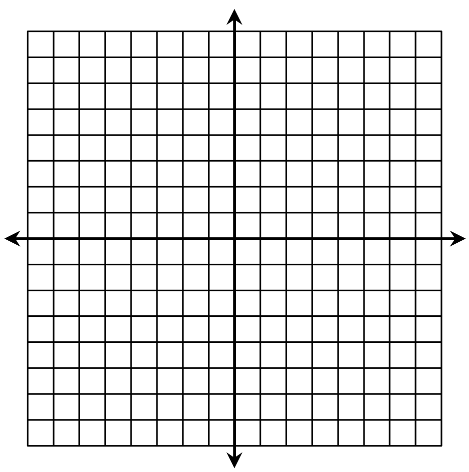
11. $f(x) = 3(x-4)^2$

x	$f(x)$

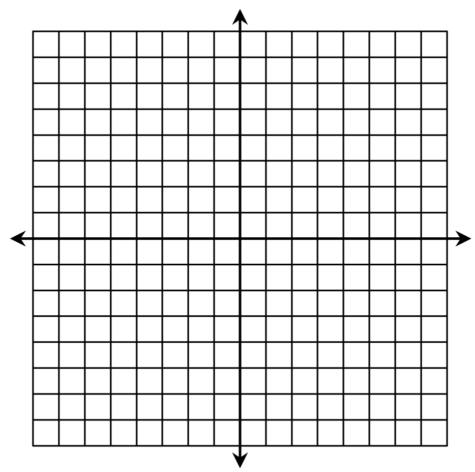


Directions: Graph each piecewise function.

12 $f(x) = \begin{cases} -\frac{1}{2}x - 6 & \text{if } x < -2 \\ (x-1)^2 - 5 & \text{if } x > -2 \end{cases}$



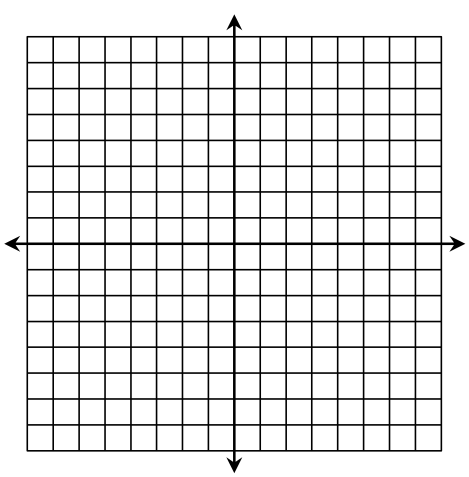
13. $f(x) = \begin{cases} -2x^2 + 6 & \text{if } x \le 1 \\ -3x + 4 & \text{if } x > 1 \end{cases}$



Directions: Give the vertex and axis of symmetry of each quadratic inequality. Then graph.

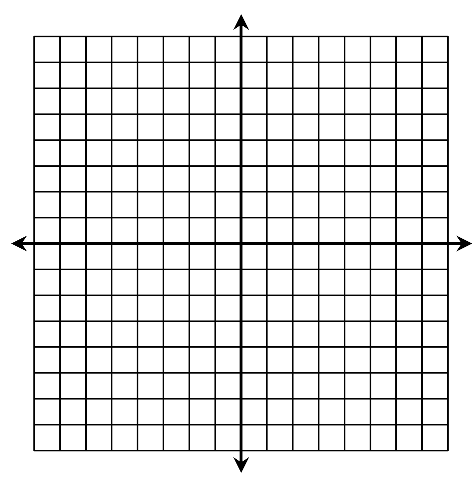
14. $y < -(x-3)^2$

x	$f(x)$



15. $y \ge 4(x+1)^2 - 7$

x	$f(x)$



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Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
ALGEBRA I REVIEW: *Perfect Square Trinomials*	A trinomial of the form $ax^2 + bx + c$ where ______________________________. **Factor the following trinomials:** • $x^2 + 8x + 16$ = ________________ • $m^2 - 18m + 81$ = ________________ • $a^2 + 2a + 1$ = ________________ • $p^2 - 10p + 25$ = ________________
STANDARD FORM $f(x) = ax^2 + bx + c$ ⬇ **VERTEX FORM** $f(x) = a(x-h)^2 + k$	If the standard form equation is a perfect square (like ex. 1), simply factor to convert to vertex form. If not, you can use a process called **completing the square** to write the equation in vertex form. ① **GROUP** $(ax^2 + bx)$ ② If $a \neq 1$, **FACTOR** it outside so it becomes $a(x^2 + bx)$ ③ **COMPLETE THE SQUARE** by taking half of b and square it. This is the new "c". Add this to "$x^2 + bx$". This is the perfect square trinomial. ④ **SUBTRACT** $a \cdot c$ from the end of the equation. ⑤ **FACTOR** the trinomial and **SIMPLIFY** the end of the equation.

Directions: Write each function in vertex form. Give the vertex.

1. $f(x) = x^2 + 4x + 4$	**2.** $f(x) = x^2 - 8x + 18$
3. $f(x) = -x^2 + 6x - 5$	**4.** $f(x) = 2x^2 - 12x + 13$

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5. $f(x) = x^2 - 3x - 2$

6. $f(x) = -x^2 - 9x - 22$

7. $f(x) = x^2 + 5x$

8. $f(x) = 4x^2 - 8x$

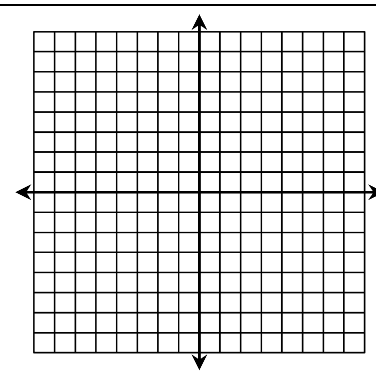
9. $f(x) = -2x^2 + 20x - 46$

10. $f(x) = -\frac{1}{2}x^2 - 4x - 5$

Directions: Convert to vertex form. Identify the vertex, axis of symmetry, then graph.

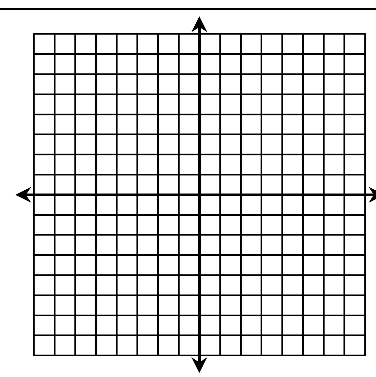
11. $f(x) = x^2 - 12x + 39$

x	$f(x)$



12. $f(x) = -3x^2 - 12x - 8$

x	$f(x)$



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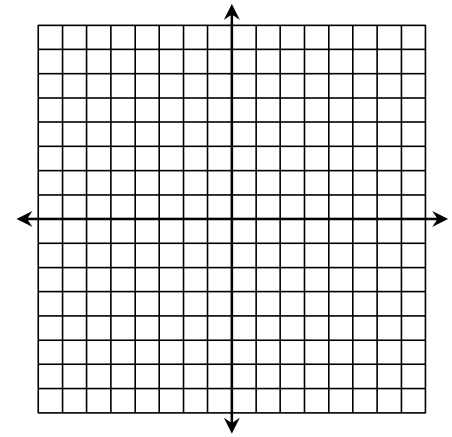
QUADRATIC FUNCTIONS

PARENT FUNCTION:

- Creates a U-shape curve called a ________________.
- The __________ _____ ______________ is a vertical line that divides the parabola into two equal parts.
- The turning point is called the _______________.

x	$f(x)$



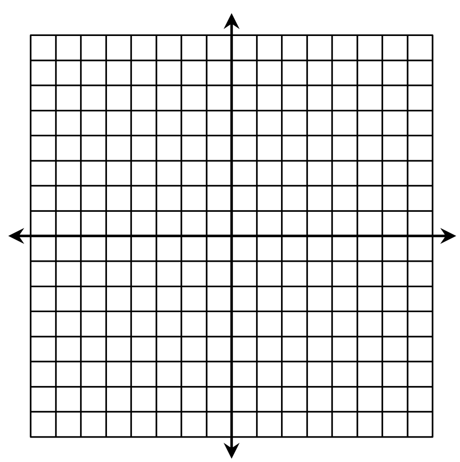
STANDARD FORM:

Axis of Symmetry: ________________

Plug back in to find the vertex!

EXAMPLE: $y = x^2 - 4x + 1$

x	$f(x)$



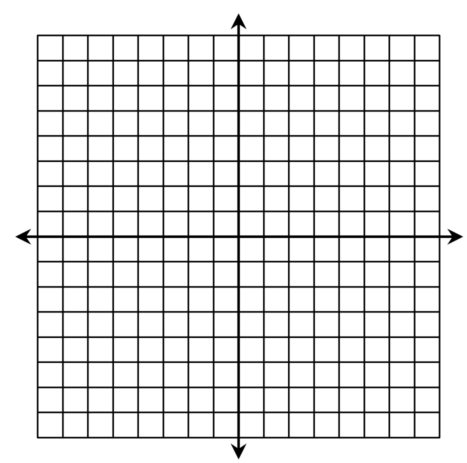
VERTEX FORM:

Axis of Symmetry: ________________

Vertex: ______________

EXAMPLE: $y = -2(x+1)^2 + 6$

x	$f(x)$



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Name:	Date:
Topic:	**Class:**

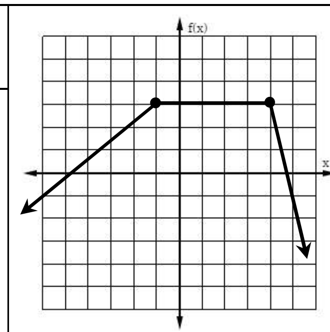
Main Ideas/Questions	Notes/Examples

INCREASING & DECREASING
Intervals

Moving from left to right, a function may increase, decrease, or remain constant on certain intervals.

For example, the function to the right is

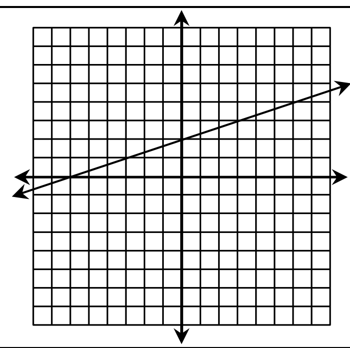
- <u>increasing</u> on the interval ___________.
- <u>constant</u> on the interval ___________.
- <u>decreasing</u> on the interval ___________.



EXAMPLES

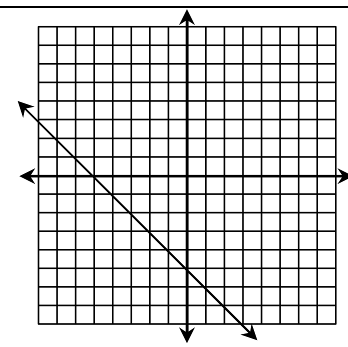
Identify the intervals on which each function increases or decreases.

1.



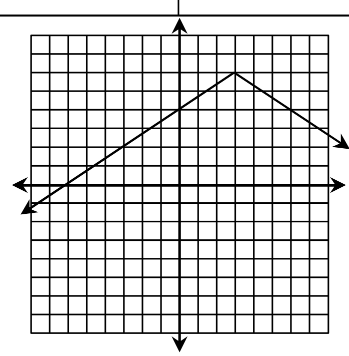
Increasing Interval(s):	Decreasing Interval(s):

2.



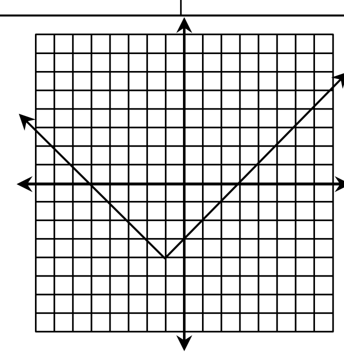
Increasing Interval(s):	Decreasing Interval(s):

3.



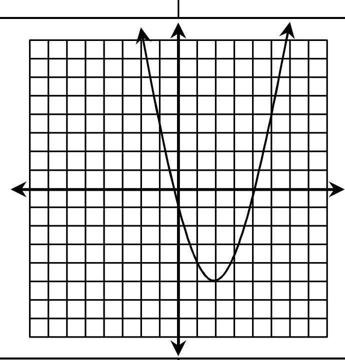
Increasing Interval(s):	Decreasing Interval(s):

4.



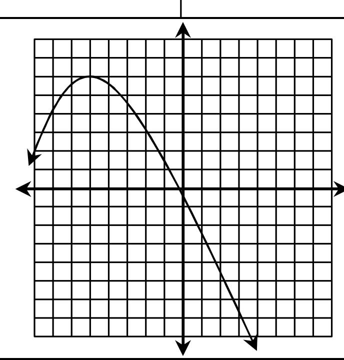
Increasing Interval(s):	Decreasing Interval(s):

5.



Increasing Interval(s):	Decreasing Interval(s):

6.



Increasing Interval(s):	Decreasing Interval(s):

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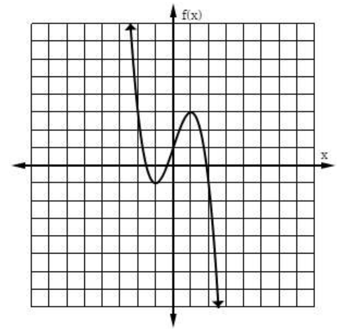
END BEHAVIOR

As x moves towards positive infinity and negative infinity, end behavior describes what is happening to the value of $f(x)$.

Describe the end behavior of the graph to the right:

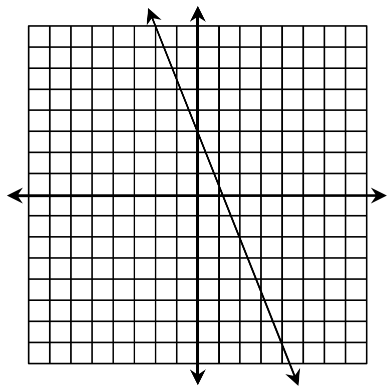
As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________



Describe the end behavior of each function.

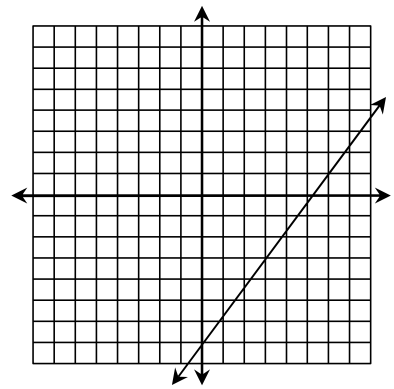
7.



As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________

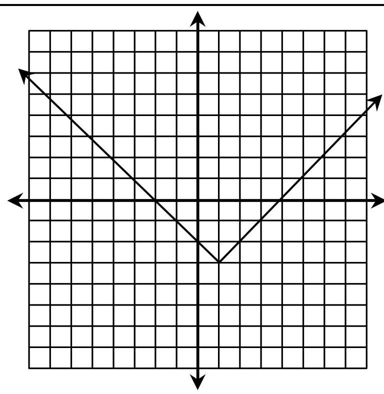
8.



As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________

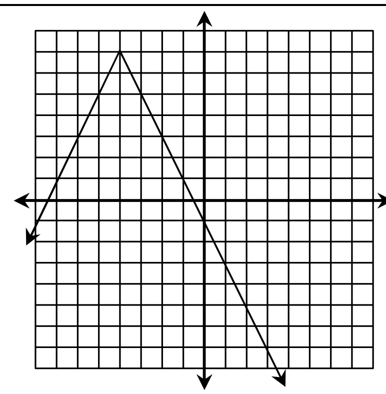
9.



As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________

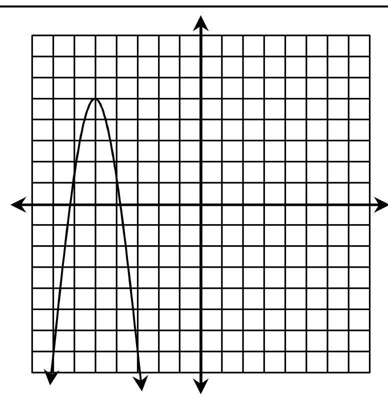
10.



As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________

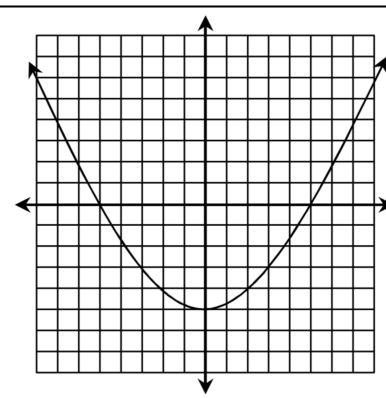
11.



As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________

12.



As $x \to \infty$, $f(x) \to$ ________

As $x \to -\infty$, $f(x) \to$ ________

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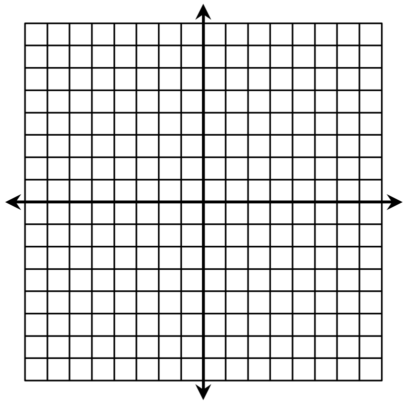
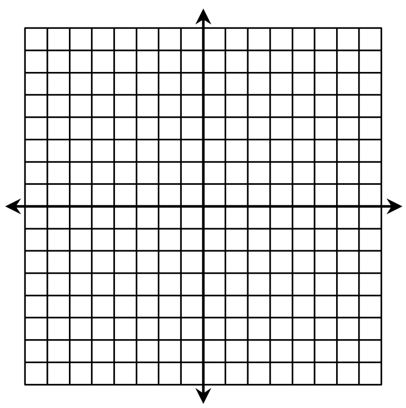
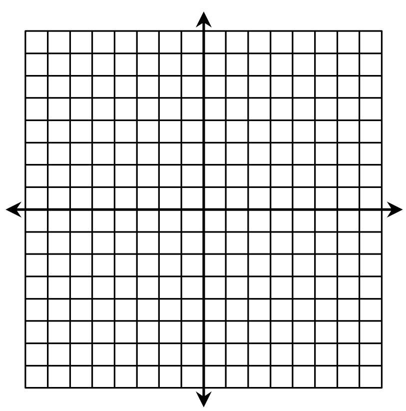
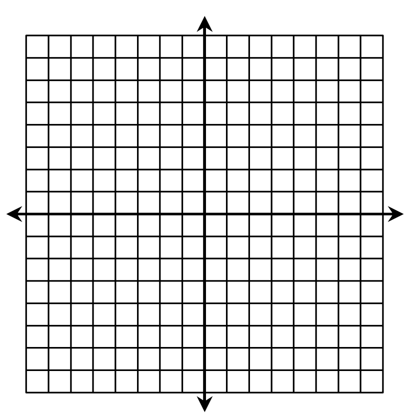
PARENT FUNCTIONS

A **parent function** is the simplest function of the family.
A **family of graphs** displays similar characteristics.

PARENT FUNCTION	GRAPH	CHARACTERISTICS
LINEAR		• ***D***: ________________; ***R***: ________________ • ***x*-intercept**: ________; ***y*-intercept**: ________ • **End Behavior**: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • **Increasing Interval(s):** ____________________ • **Decreasing Intervals(s):** ____________________
ABSOLUTE VALUE		• ***D***: ________________; ***R***: ________________ • ***x*-intercept**: ________; ***y*-intercept**: ________ • **End Behavior**: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • **Increasing Interval(s):** ____________________ • **Decreasing Intervals(s):** ____________________
QUADRATIC		• ***D***: ________________; ***R***: ________________ • ***x*-intercept**: ________; ***y*-intercept**: ________ • **End Behavior**: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • **Increasing Interval(s):** ____________________ • **Decreasing Intervals(s):** ____________________
CUBIC		• ***D***: ________________; ***R***: ________________ • ***x*-intercept**: ________; ***y*-intercept**: ________ • **End Behavior**: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • **Increasing Interval(s):** ____________________ • **Decreasing Intervals(s):** ____________________

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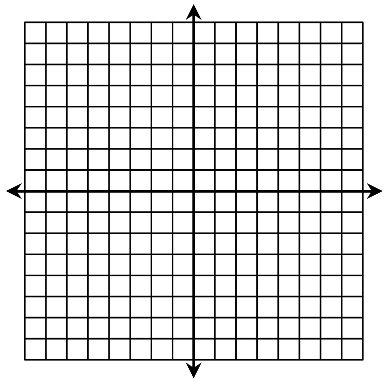
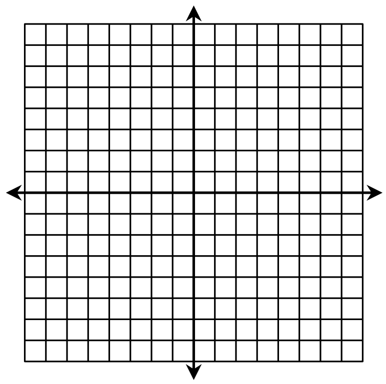
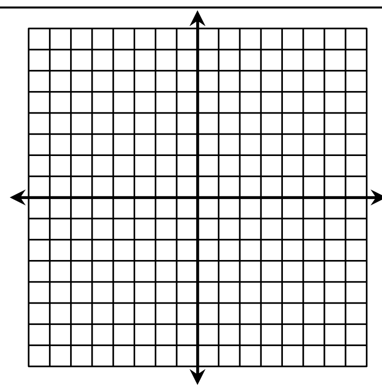
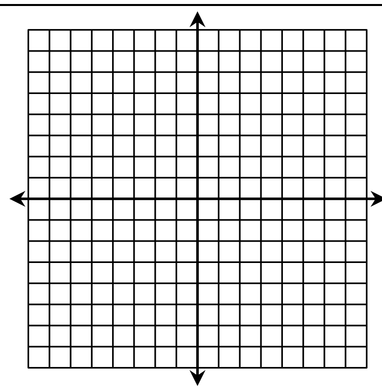
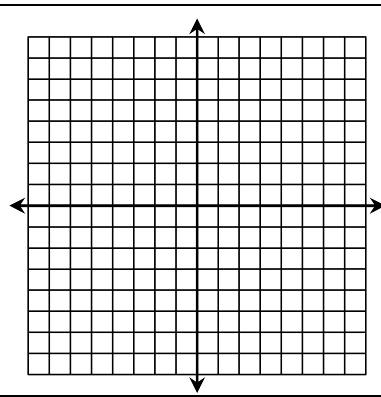
SQUARE ROOT		• D: ________; R: ________ • x-intercept: ________; y-intercept: ________ • End Behavior: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • Increasing Interval(s): ________ • Decreasing Intervals(s): ________
CUBE ROOT		• D: ________; R: ________ • x-intercept: ________; y-intercept: ________ • End Behavior: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • Increasing Interval(s): ________ • Decreasing Intervals(s): ________
RECIPROCAL		• D: ________; R: ________ • x-intercept: ________; y-intercept: ________ • End Behavior: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • Increasing Interval(s): ________ • Decreasing Intervals(s): ________ • Asymptote(s): ________
EXPONENTIAL		• D: ________; R: ________ • x-intercept: ________; y-intercept: ________ • End Behavior: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • Increasing Interval(s): ________ • Decreasing Intervals(s): ________ • Asymptote(s): ________
LOGARITHMIC		• D: ________; R: ________ • x-intercept: ________; y-intercept: ________ • End Behavior: As $x \to$ ______, $f(x) \to$ ______ As $x \to$ ______, $f(x) \to$ ______ • Increasing Interval(s): ________ • Decreasing Intervals(s): ________ • Asymptote(s): ________

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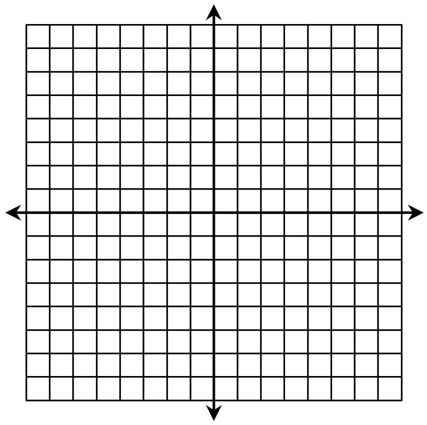
FUNCTION FAMILIES REVIEW

{Linear, Absolute Value, and Quadratic}

Graph each function, then identify the characteristics.

1. $f(x) = -3x + 5$



Function Family: ______________________________

Parent Function: ______________________________

D: ____________________; **R:** ____________________

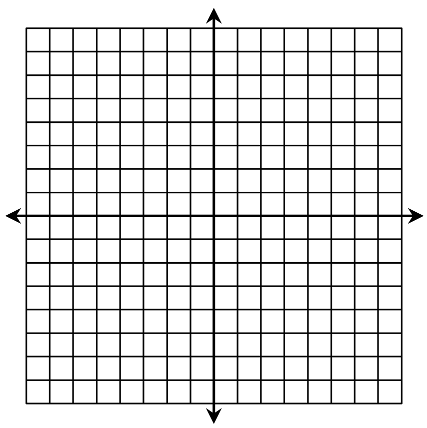
End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ________________________

Decreasing Interval(s): ________________________

2. $f(x) = |x - 1| - 4$



Function Family: ______________________________

Parent Function: ______________________________

D: ____________________; **R:** ____________________

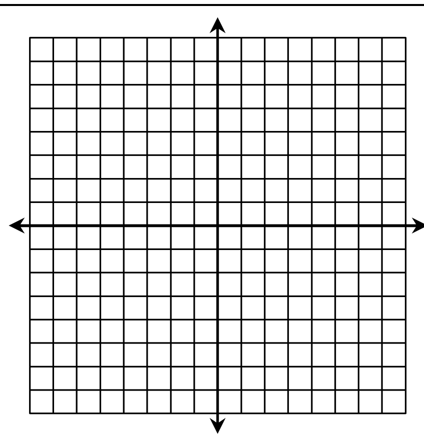
End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ________________________

Decreasing Interval(s): ________________________

3. $f(x) = -x^2 + 8x - 11$



Function Family: ______________________________

Parent Function: ______________________________

D: ____________________; **R:** ____________________

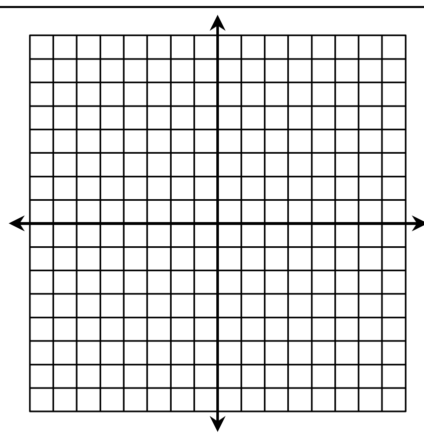
End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ________________________

Decreasing Interval(s): ________________________

4. $f(x) = -|x| + 6$



Function Family: ______________________________

Parent Function: ______________________________

D: ____________________; **R:** ____________________

End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ________________________

Decreasing Interval(s): ________________________

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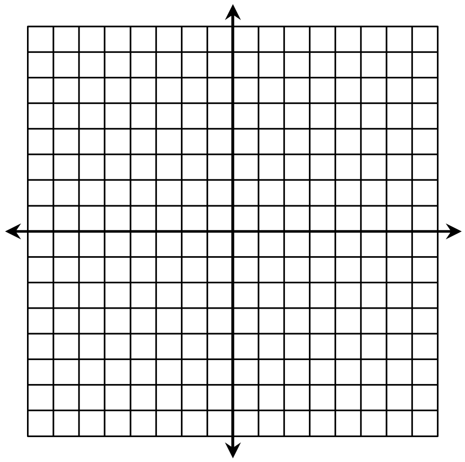
5. $f(x) = 2(x+2)^2 - 7$



Function Family: ____________________

Parent Function: ____________________

D: ________________; **R:** ________________

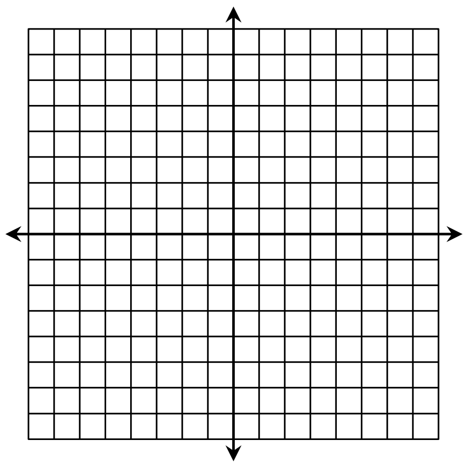
End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ____________________

Decreasing Interval(s): ____________________

6. $f(x) = \dfrac{5}{2}x - 1$



Function Family: ____________________

Parent Function: ____________________

D: ________________; **R:** ________________

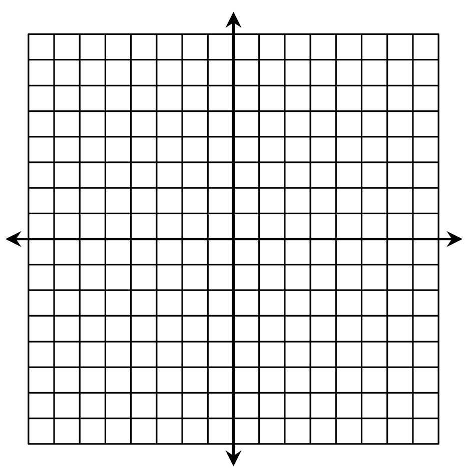
End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ____________________

Decreasing Interval(s): ____________________

7. $f(x) = -(x-5)^2 + 6$



Function Family: ____________________

Parent Function: ____________________

D: ________________; **R:** ________________

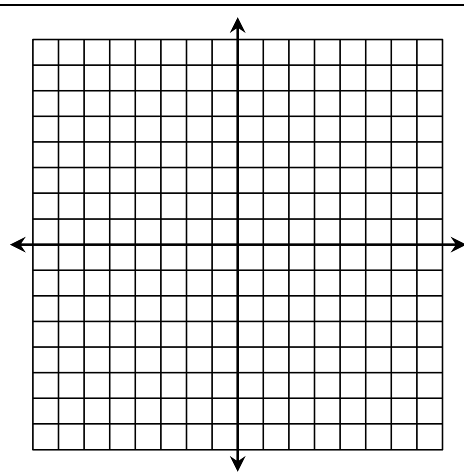
End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ____________________

Decreasing Interval(s): ____________________

8. $f(x) = \dfrac{1}{2}|x+3| + 3$



Function Family: ____________________

Parent Function: ____________________

D: ________________; **R:** ________________

End Behavior: As $x \to \infty$, $f(x) \to$ _______

As $x \to -\infty$, $f(x) \to$ _______

Increasing Interval(s): ____________________

Decreasing Interval(s): ____________________

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