Algebra 2 Honors Summer Project

There is no project to complete.

Attached is practice problems reviewing material from Algebra 1 that you should have mastered in order to be successful in an Honors Algebra 2 class. I will not be collecting this packet for a grade.

School starts on Wednesday, August 9th.

I plan to answer questions over the review material on Wednesday, Thursday, and Friday then give the test covering this material on Monday, August 14th. You will not have access to a calculator. Numbers will be kept to small values that you should be able to do in your head or quickly with minimal scratch work. The review material will be very similar to the test given.

You can view videos of the review material on the Summer Honors Algebra 2 Google Classroom. The access code is: **by6ys2u.** Review videos will be posted by June 5th.

If you have questions, feel free to email me **cphelan@vidorisd.org**

I will be checking my school email, but the response time may be a few days since I am not actually at work during the summer. Please allow some grace in response time.
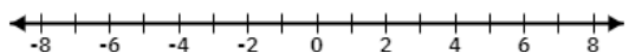

Thanks,

Cheryl Phelan

TOPIC #1 Solving Equations

Find the value of x for each equation.

1. $\quad 3 - 3x = 18$	2. $\quad 4 - \frac{1}{2}x = -12$
3. $\quad \frac{3}{4}x + 17 = 23$	4. $\quad 9x - 4(x + 1) = 31$
5. $\quad -6(x - 4) + 8x = 2(x + 9)$	6. $\quad 3x - (7x + 12) = 2(x - 3)$
7. $\quad 2x - 2(4x - 3) = 6 - 6x$	8. $\quad \dfrac{7}{x-8} = \dfrac{3}{x}$

TOPIC #2 Solving & Graphing Inequalities

Find the solution set for the variable in each inequality, then graph the solution set.

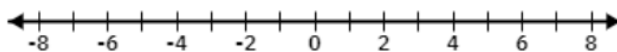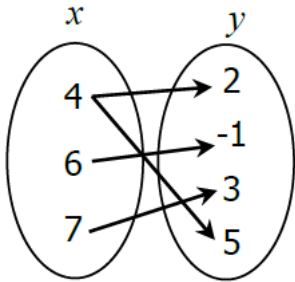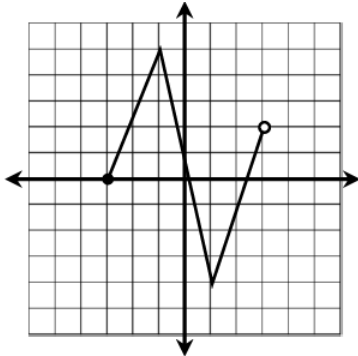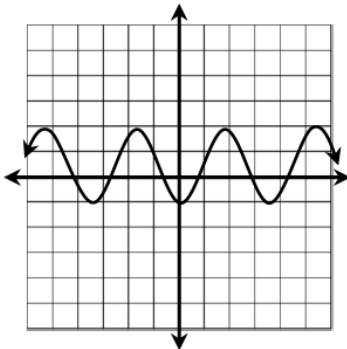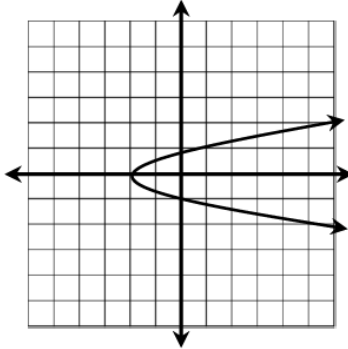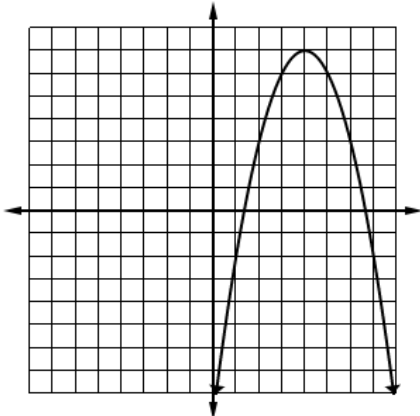|	
1. $11x + 13 \geq -20$	2. $-2x + 6 > 3x - 34$
3. $3x - 7(x + 3) \geq -13$	4. $4 - 8x < 2(5 - 3x)$

TOPIC #3 Relations & Functions

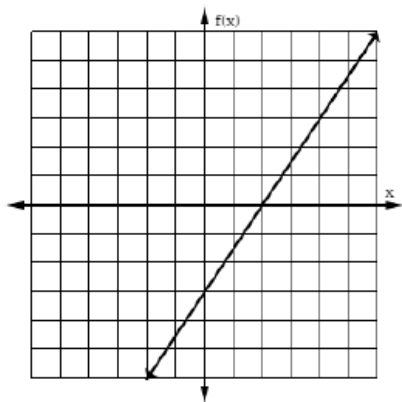For each relation, find the domain and range. Then identify the relation as a function or not a function.

1.	2.	3.

1.

x	y
-1	7
2	3
5	0
-1	2

Domain:

Range:

Function?

2.

Domain:

Range:

Function?

3.

Domain:

Range:

Function?

4.

Domain:

Range:

Function?

5.

Domain:

Range:

Function?

6.

Domain:

Range:

Function?

TOPIC #4 Function Notation & Evaluating Functions

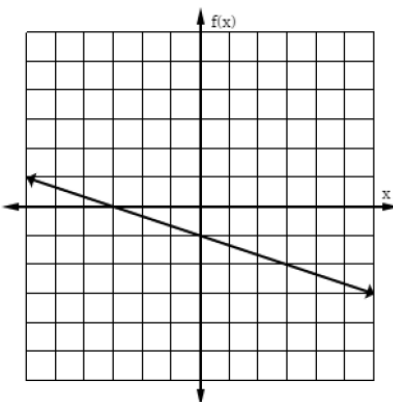|	
1. If $f(x) = -x - 7$, find $f(-5)$.	2. If $g(x) = x^2 - 2x + 11$, find $g(-2)$.
3. If $f(x) = 2x^2 - x$, find $f(-4) - f(9)$.	4. If $h(x) = 1 - \frac{2}{3}x$, find $h(-6)$.
5. Find the range of the function $f(x) = 3x - 8$ if the domain is $\{-4, 2, 7\}$.	6. Find the range of the function $f(x) = -x^2 + 4x$ if the domain is $\{-2, 0, 1\}$.
7. Given the graph of $f(x)$ below, find $f(3)$. 	8. Given $f(x) = \frac{5}{2}x + 7$, if $f(x) = -13$, find x.

TOPIC #5 Intercepts of Functions

1.	2.	3.
x-intercept(s): _____ y-intercept: _____	x-intercept(s): _____ y-intercept: _____	x-intercept(s): _____ y-intercept: _____
4. y = 2x – 10	5. $y = -\frac{3}{2}x + 9$	6. 2x + y = -2
x-intercept(s): _____ y-intercept: _____	x-intercept(s): _____ y-intercept: _____	x-intercept(s): _____ y-intercept: _____

TOPIC #6 Slope

1. There are _____ types of slope. Sketch them.
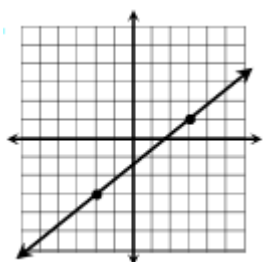
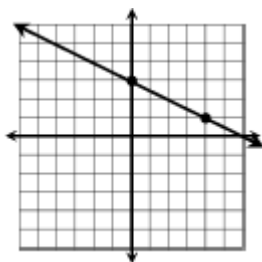   positive   negative   zero   undefined
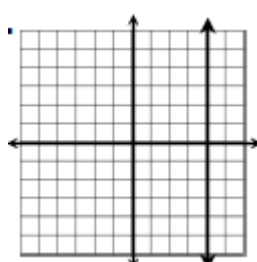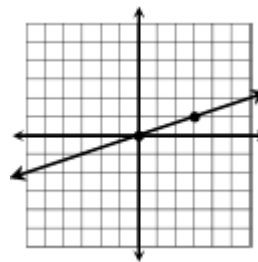
Find the slope of each line graphed below.

2.	3.	4.	5.

To find the slope (*m*) given two points, use the **slope formula**:

$$m = \frac{the\ change\ in\ y}{the\ change\ in\ x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope of the line passing through the given two points.

6. (-12, -1) and (-3, -4)	7. (-11, 7) and (-11, -2)
8. (9, -3) and (11, 7)	9. (12, 11) and (-9, 11)

TOPIC # 7 Slope-Intercept Form and Standard Form

Slope-Intercept Form: y = mx + b   **Standard Form: Ax + By = C**

1. Write a linear equation in slope-intercept form with a slope of -1 and a y-intercept of 4.	2. Write a linear equation in slope-intercept form with a slope of $\frac{3}{4}$ and a y-intercept of -5.

For each of the following equations, write the equation in slope-intercept form, then identify the slope and y-intercept.

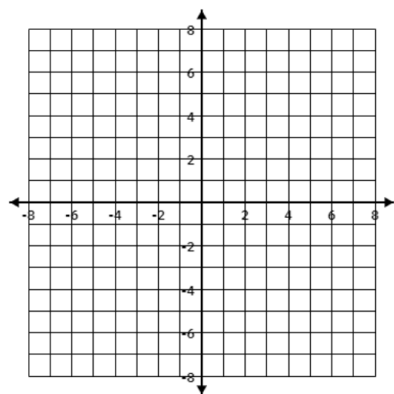|	
3. x – y = 3 slope-intercept form: _____ slope: _____ y-intercept: (,)	4. 4x + 10y = -10 slope-intercept form: _____ slope: _____ y-intercept: (,)
5. 4x + y = 8 slope-intercept form: _____ slope: _____ y-intercept: (,)	6. x – 3y = 6 slope-intercept form: _____ slope: _____ y-intercept: (,)

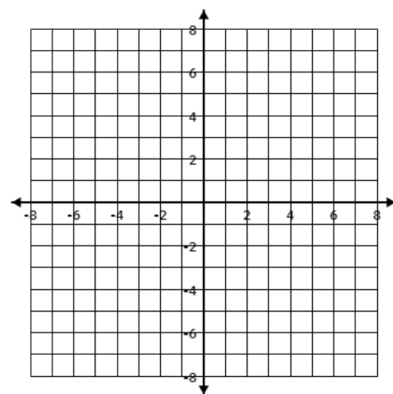# TOPIC #8 Graphing Linear Functions

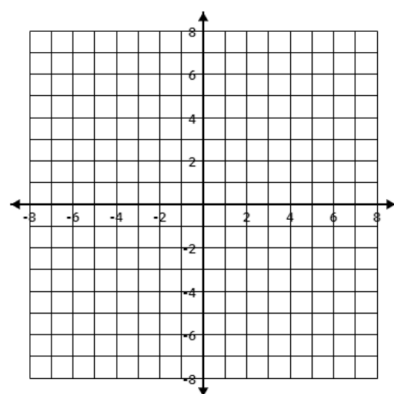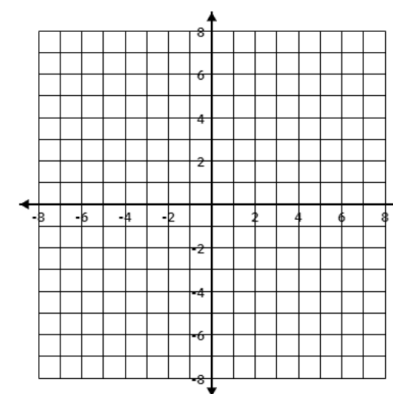Graph each linear equation. Convert to slope-intercept form when necessary.

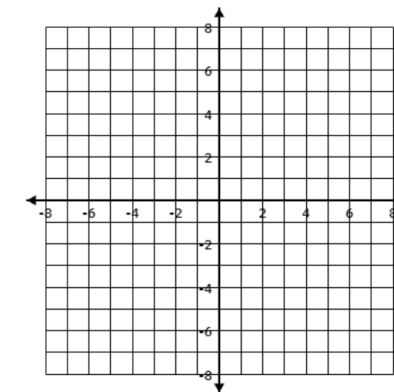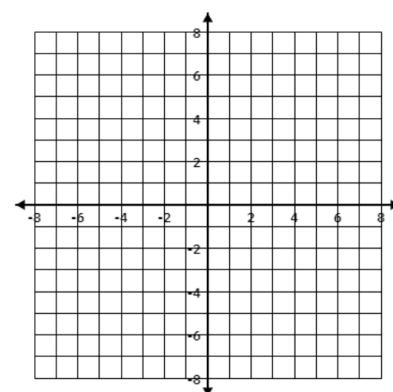1. $y = -3x + 7$

2. $y = 4x$
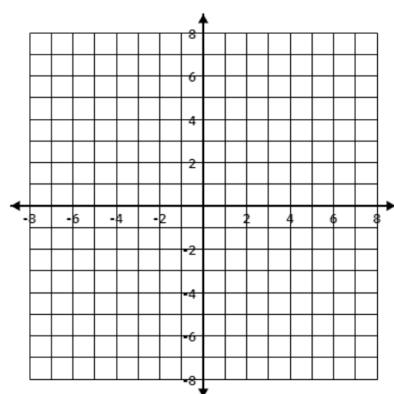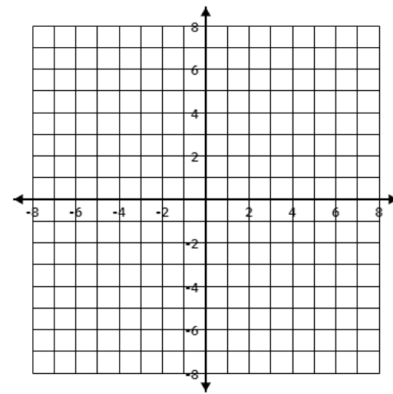
3. $x - y = 5$

4. $x + 2y = 4$

5. $-10x + 8y = -8$

6. $3x - 2y = -6$

7. $x = -5$

8. $y = 1$

TOPIC #9 Writing Linear Equations Given a Point and a Slope

When given a point (x_1 , y_1) and the slope, *m*, use the point-slope formula: $y - y_1 = m(x - x_1)$

Write a linear equation in slope-intercept form using the given point and slope.

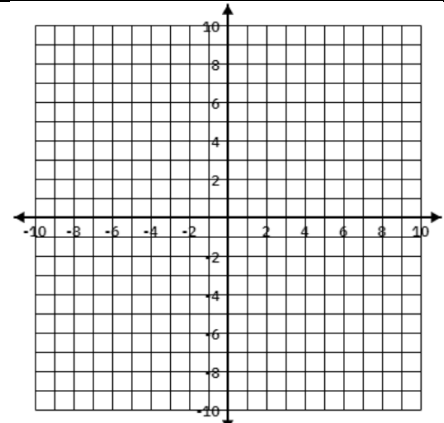|	
1. (2, 7); slope = 3	2. slope = -1; (1, 4)
3. slope of $-\frac{1}{2}$ and has the point (4, -2)	4. slope of $\frac{2}{3}$ and has x-intercept of 6

TOPIC #10 Solving Systems Graphically

Solve each system of equations by graphing.
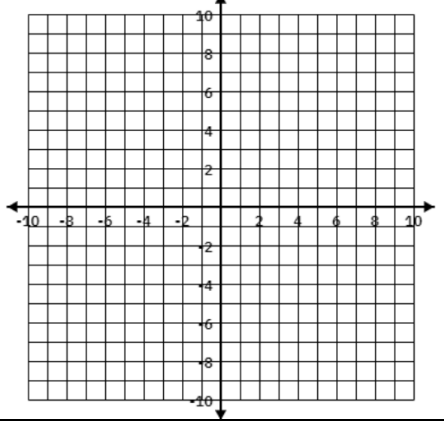
1.

$y = -3x + 2$

$y = x - 6$

Solution: _____
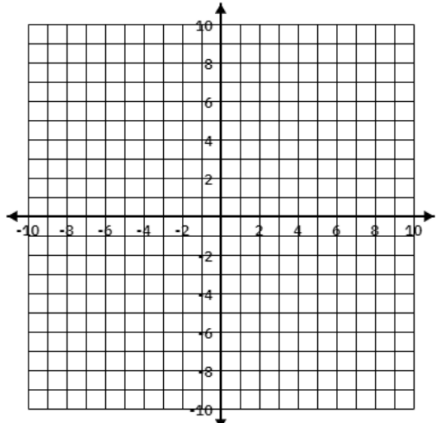
2.

$2x + y = 1$

$x - 2y = 18$

Solution: _____

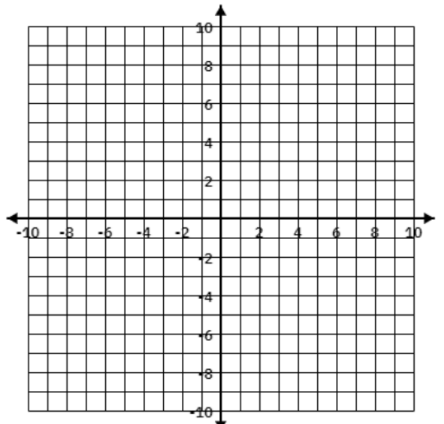**3.**

$4x + y = -1$

$2y = 6 - 8x$

Solution: _____

4.

$x + 5y = -10$

$4x - 2y = -18$

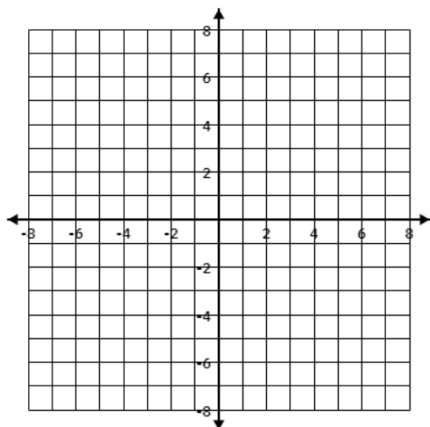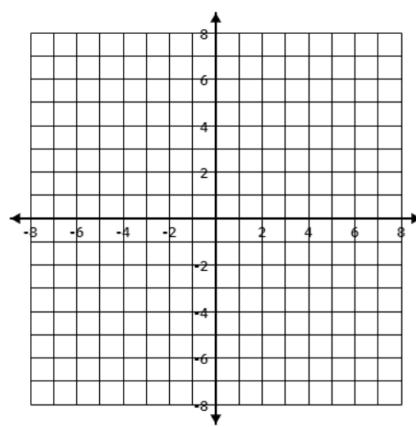Solution: _____

TOPIC #11 Linear Inequalities

Graph each linear inequality.

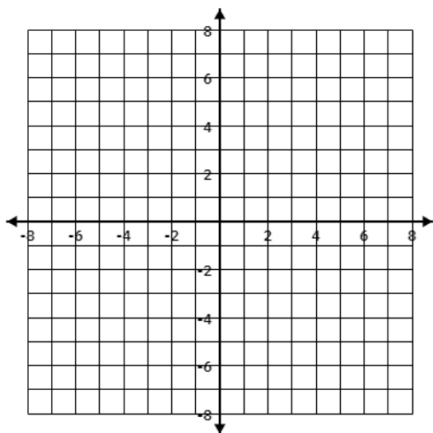| 1. y > -3x – 1	2. 5x – 3y ≥ 6

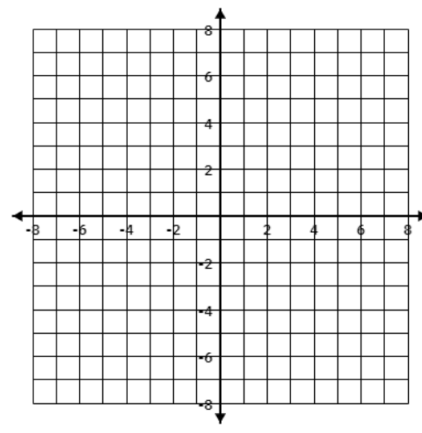# TOPIC #12 Systems of Linear Inequalities

Graph the solution to each system of inequalities.
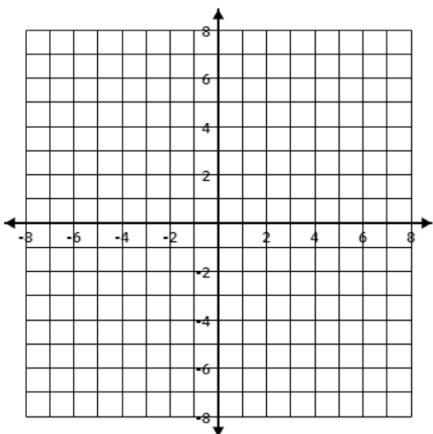
1. x + y < -1 x – y > 8	2. y ≥ -x + 4 -x + 3y ≤ 21
3. 4x + y ≥ 4 3x – 2y < 14	4. x ≤ -3 4x – 5y > -35

TOPIC #13 Simplifying Monomials

Simplify each expression.

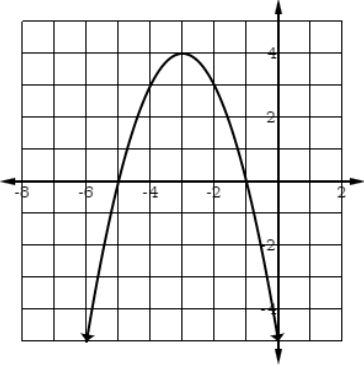|		
1. $7x \cdot x^2 \cdot 8w^2$	2. $(4w^5x^3)^3$	3. $\dfrac{35x^{10}}{5x^2}$
4. $(-2wx^6z^3)^2 \cdot -5w^2x$	5. $\dfrac{w^2x^{16}z^3}{w^2x^4z^8}$	6. $\dfrac{(-3x^6)^2}{5x^3 \cdot 3x^3}$
7. $-2w^4 \cdot (w^3x)^2 - 13w^{10}x^2$	8. $\left(\dfrac{4w^2x^4}{6wx^5}\right)^2$	9. $\dfrac{-5w^8x^2}{20w^2x^{-1}}$
10. $(2x)^{-2} \cdot (2x^{-7})^3$	11. $\dfrac{w^{-3}x^{12}}{(wx)^{-4}}$	12. $\left(\dfrac{wx^{-7}}{3w^5x^{-2}}\right)^4$

TOPIC #14 Simplifying Polynomials
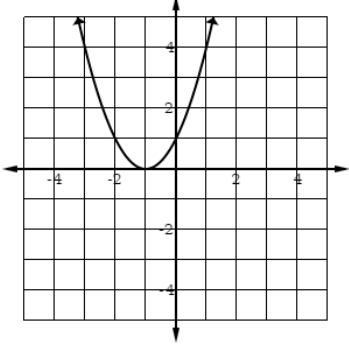
Simplify each expression.

1. $(x^2 - 3x + 14) + (3x^2 + x - 25)$	2. $(2x^2 + 3x - 2) - (x^2 - 4x - 1)$
3. $(5 - 8x) - (8x - 13 + 2x^2)$	4. $(6 + x^3 + x - 3x^2) + (7x^3 + 11 - 6x + x^2)$
5. $3w^3x^2 (2w^2 - 7wx + x^2)$	6. $8x(x^2 + 7x - 2) - (9x^3 - 2x^2)$

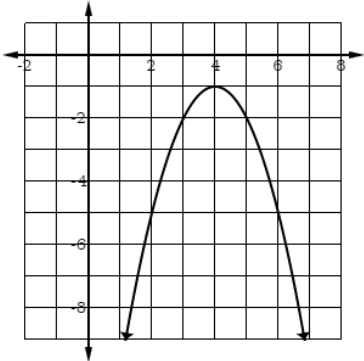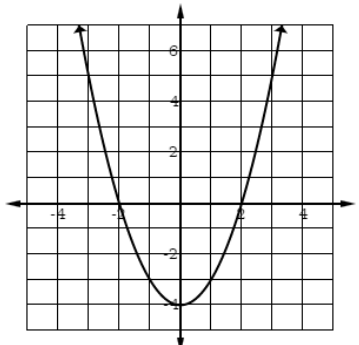|		
7. $(x - 9)(x + 7)$	8. $(x + 8)(x - 8)$	9. $(x + 1)(4x + 3)$
10. $(2x - 5)(3x - 4)$	11. $(2w + 5x)(w - x)$	12. $(2x - 1)^2$

13. $(x - 4)(x^2 + 5x + 3)$	14. $(2x + 1)(x^2 - 3x - 11)$
15. $\dfrac{18wx^3 + 12w^2x^2 - 6wx}{6wx}$	16. $\dfrac{-24x^4 - 8x^3 + 40x^2}{-8x^2}$

TOPIC #15 Graphing Quadratic Equations

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

Axis of Symmetry:	Vertex:	max
		min
Domain:	List the Zeros:	
Range:	y-intercept:	

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

Axis of Symmetry:	Vertex:	max
		min
Domain:	List the Zeros:	
Range:	y-intercept:	

3. $f(x) = -x^2 + 8x - 17$

Axis of Symmetry:	Vertex:	max
		min
Domain:	List the Zeros:	
Range:	y-intercept:	

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

Axis of Symmetry:	Vertex:	max
		min
Domain:	List the Zeros:	
Range:	y-intercept:	