

ALGEBRA 2 TRIG G
SEMESTER 1 REVIEW

Name_____

Chapter 1



Evaluate each expression.

1. $5 \bullet [(-2 + 3) + 4 \bullet 2]$

2. $2 + 4 \div 1 \bullet 3 - 10$

3. Evaluate $\frac{y^3}{3ab + 2}$ if $a = -2$, $b = -5$, and $y = 4$.

4. Simplify $4(2b + 6c) + 3b - c$

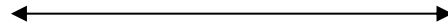
Solve each equation or inequality. Graph the solutions to the inequalities.

5. $4(a + 5) - 2(a + 6) = 3$

6. $3|x + 6| = 36$

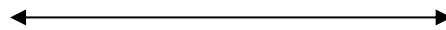
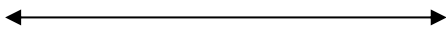
7. $|y-5|-2=10$

8. $2x-6 \leq 12$ or $35-2x < 5$



9. $|2x-9| \leq 27$

10. $|2x+4| > 12$



Write an algebraic expression for each verbal expression.

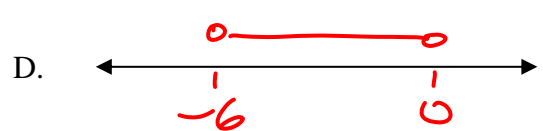
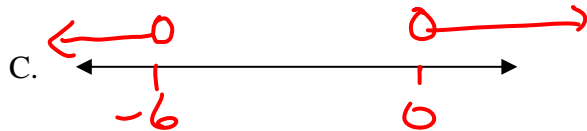
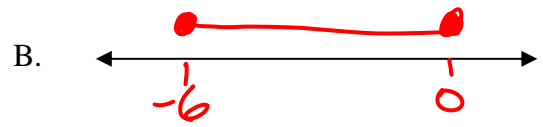
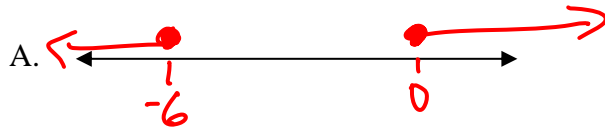
11. The sum of 4 and 2 times a number.

12. The cube of the product of 2 and 8.

13. 4 less than the product of a number and seven.

Multiple Choice: Circle the correct answer.

14. Which of the following graphs below represent the solution set for $2|x+3| \leq 6$.



15. If $-2x - 5 = 15$, what is the value of $12x + 20$?

- A. 103 B. 140 C. -140 D. -100 E. -118

16. Evaluate the expression. $2 + 6 \div 3 - 3^2$

- A. -3 B. -1 C. 3 D. 5 E. -5

17. Evaluate the expression. $[2 + (4^2 \cdot \frac{1}{2})] \div 2$

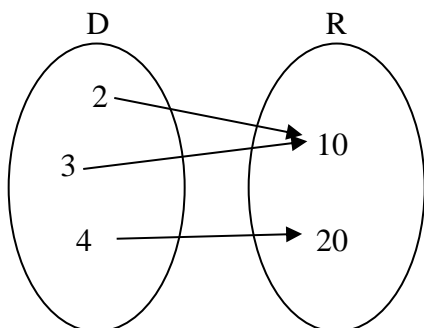
- A. 5 B. 12 C. 13 D. 14 E. 17

Chapter 2



Determine whether each relation is a function. Write *yes* or *no*.

1)

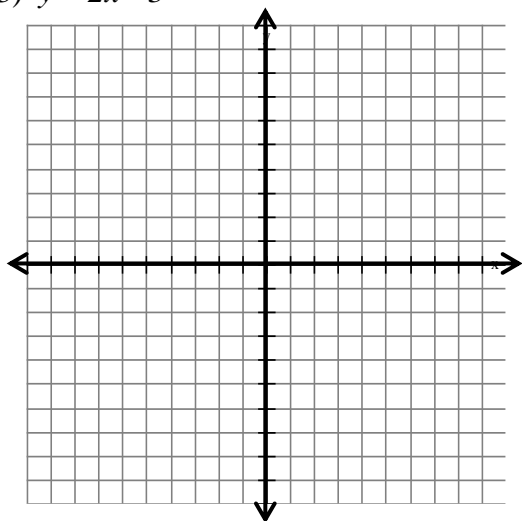


2)

X	y
-1	2
-2	4
-1	5
-3	7
3	8

Graph the relation and find its domain and range. Determine whether the relation is a function.

3) $y = 2x - 3$



4) If $f(x) = \frac{x-5}{3}$ and $g(x) = 2 - 3x$.

a) Find $f(-4)$

b) Find $g(5)$

5) Is this a linear equation: $y = 3x - 2xy$?

6) Write these equations in standard form

a) $y = \frac{3}{8}x - 2$

b) $x = -\frac{5}{3}y + \frac{7}{2}$

Find the x-intercept and y-intercept of the graph of each equation. Graph the equation.

7) $6x + 3y = 12$

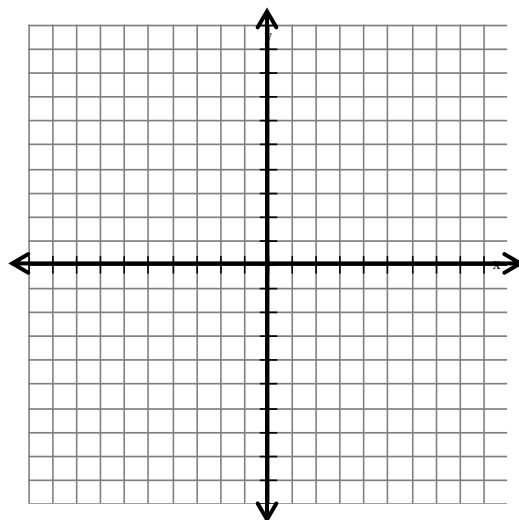
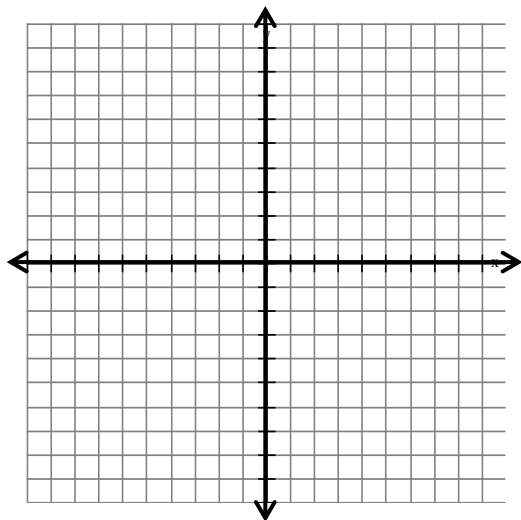
8) $3y + 4x = 24$

x-int _____

x-int _____

y-int _____

y-int _____

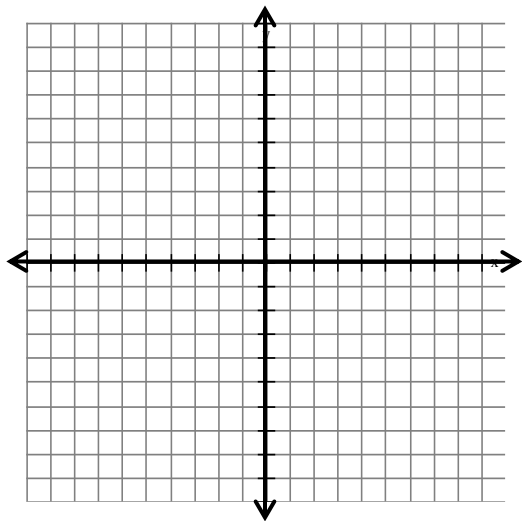


Find the slope of the line that passes through the pair of points.

9) $(-2, 2), (3, -8)$

Graph the line passing through the given point with the given slope.

10) Passes through $(1, 3)$, parallel to a line whose slope is $-\frac{1}{2}$



State the slope and y-intercept of the graph of the equation.

11) $6x = 18 - 3y$

Write an equation in slope-intercept form for the line that satisfies each set of conditions.

12) slope 2, passes through $(8, 3)$

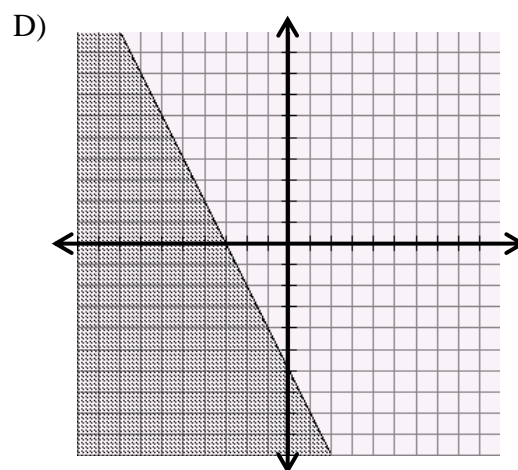
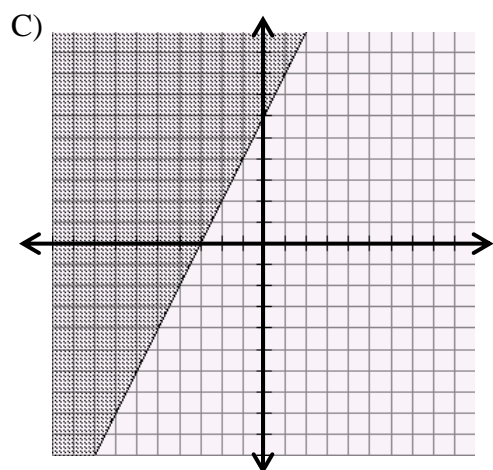
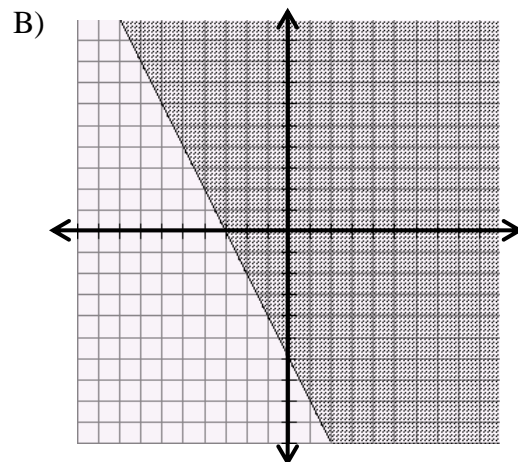
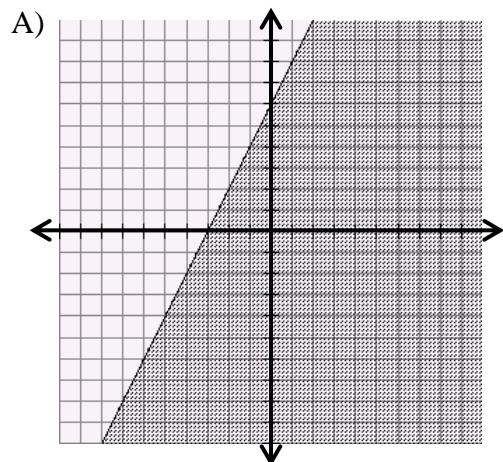
13) undefined slope, passes through $(1, 2)$

14) x-intercept of 3, y-intercept of 4

15) passes through $(8, 7)$, perpendicular to the graph $y = 4x - 3$

Multiple Choice. Circle the best answer.

16) Graph the inequality $y \leq 2x + 6$



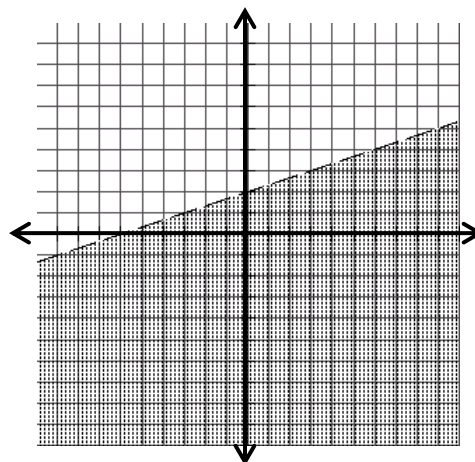
17) Which inequality represents this picture?

A) $x + 3y > 6$

B) $-x + 3y < 6$

C) $x - 3y < 6$

D) $3x - y > 6$



18) Write the equation $-2x = -3y + 5$ in standard form ($Ax + By = C$). Identify A, B, C.

19) **Use your calculator** (STAT, Edit, L_1, L_2 , Calc, 4:LinReg) to create a prediction equation for the data below. Then use your equation to determine the number of calories burned in a 60 minute workout.

HEALTH Alton has a treadmill that uses the time on the treadmill and the speed of walking or running to estimate the number of Calories he burns during a workout. The table gives workout times and Calories burned for several workouts.

Time (min)	18	24	30	40	42	48	52	60
Calories Burned	260	280	320	380	400	440	475	?

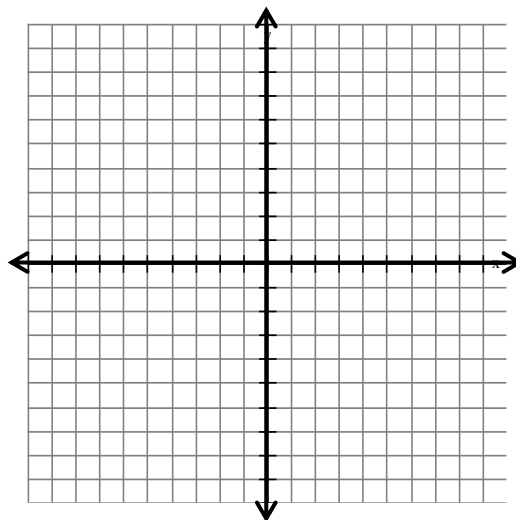
Chapters 3 & 4



- 1) Solve the system by the method of your choice.
(use the graph below if you need to)

$$-2x + 4y = -8$$

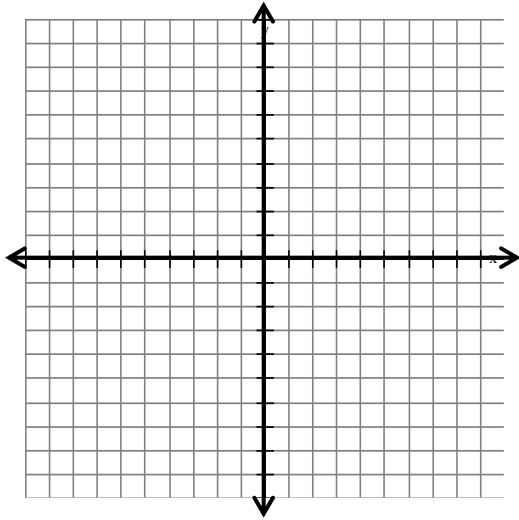
$$-x - 4y = 2$$



2) Solve the system by graphing.

$$x - 2y = -6$$

$$y = 8 - 2x$$



3) Solve the system by substitution $7x + 3y = 19$

$$y = -x + 2$$

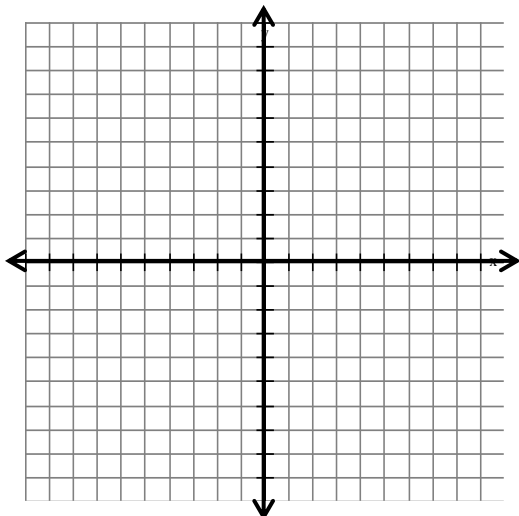
4) Solve the system by elimination $x - 4y = -10$

$$2x + 5y = 6$$

5) Solve the system of inequalities by graphing.

$$y \leq \frac{2}{3}x - 3$$

$$-2y > x + 6$$



6) Solve the system using matrices on the calc. Be sure to show the matrices you are using.

$$3x - 5y + 2z = 22$$

$$2x + 3y - z = -9$$

$$4x + 3y + 3z = 1$$

7) Dave's Emergency Landscaping charges \$70 for a service call, and \$90 per hour. Sara's Super Duper Lawn Care charges \$60 for a service call, and \$100 per hour.

a. Write a system of equations to represent the total cost for each company to cure a landscaping faux pas.

b. For what number of hours would the two companies charge the same total cost.

c. If a service call lasted 6 hours, which company would be least expensive? How much would it cost.

8) Using any method, find the correct answer for the following system of equations.

$$-3x - 2y = -10$$

$$4x + 6y = 20$$

Chapter 5 Review



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

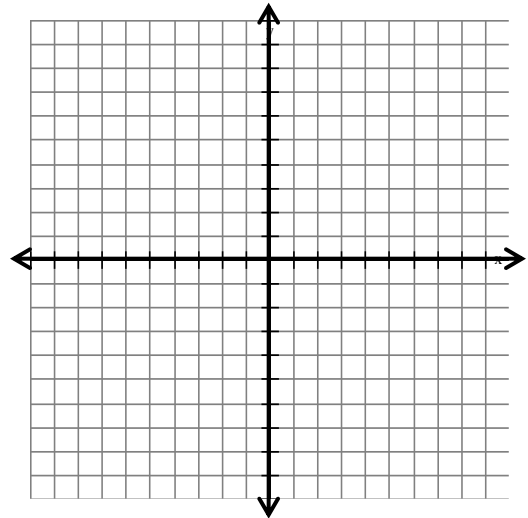
a) Find the y-intercept.

b) Determine whether the function opens up or down. Does it have a max or min?

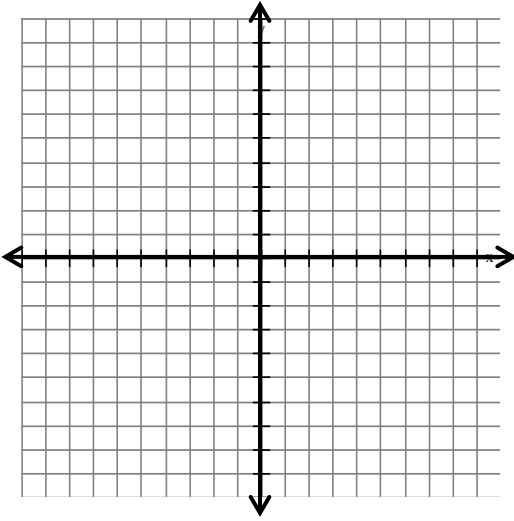
c) Find the max or min (vertex!)

d) Write the equation of the axis of symmetry.

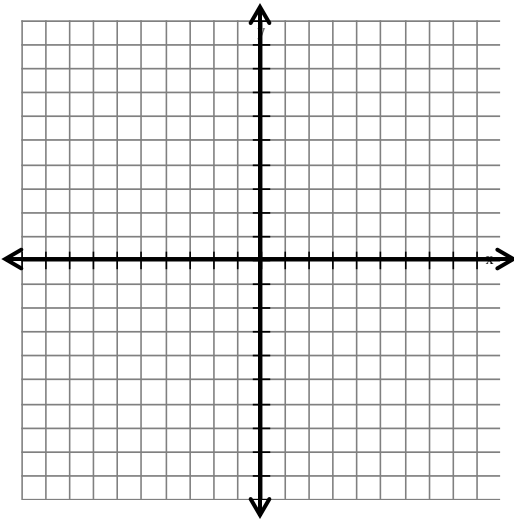
e) Graph



- 2) Solve the equation by graphing on the calculator: $x^2 + x - 6 = 0$
Check your answer by factoring.



- 3) Solve this equation by graphing on the calculator: $x^2 - 13x + 40 = 0$
Check your answer by factoring.



- 4) Use the formula $h(t) = v_0t - 16t^2$, where $h(t)$ is the height of an object in feet, v_0 is the object's initial upward velocity in feet per second, and t is the time in seconds.
A golf ball is hit with an initial upward velocity of 107 ft per sec. how long will it take the ball to hit the ground if it lands at the same elevation from which it was hit?

Solve each equation by factoring.

5) $x^2 - 4x + 4 = 0$

6) $2x^2 + 14x + 24 = 0$

7) $3x^2 + x - 2 = 0$

8) Write a quadratic equation with the given roots. Write the equation in the form $ax^2 + bx + c = 0$, where a, b, c are integers.

Roots: $-4, \frac{2}{3}$

9) For the equation $5x^2 + 2x - 4 = 0$

a) Find the value of the discriminant ($d = b^2 - 4ac$).

b) Describe the number and type of roots.

c) Solve, giving exact answers $\left(x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}\right)$

10) Simplify: $\sqrt{-108}$

11) Simplify: $\sqrt{-12w^4x^3y^2z^5}$

12) Solve: $5x^2 + 60 = 0$

13) Solve using quadratic formula:
 $4x^2 - 6x + 10 = 0$

Chapter 6



Properties of powers:

$$x^{-9} = \underline{\hspace{2cm}}$$

$$(x^3)^6 = \underline{\hspace{2cm}}$$

$$\left(\frac{x}{y}\right)^4 = \underline{\hspace{2cm}}$$

$$x^8 \cdot x^2 = \underline{\hspace{2cm}}$$

$$(xy)^3 = \underline{\hspace{2cm}}$$

$$\frac{x^6}{x^{11}} = \underline{\hspace{2cm}}$$

$$x^0 = \underline{\hspace{2cm}}$$

$$x^1 = \underline{\hspace{2cm}}$$

Simplify (no negative exponents)

1) $(3a^2b^3c)(4a^3bc^2)$

2) $\frac{9x^2y^3}{27xy^5}$

3) $(3a^3)^2$

4) $(2x)(3x^3y)^2$

4) $(2a^{-3}b^2c)(4a^3bc^{-2})$

5) $\frac{8(a^2b^3)^2}{2ab^5}$

Polynomials : Simplify

1) $(3a^2 + 2a) + (4a^2 - 3a + 7)$

2) $6b^2 + 4b - (2b^2 + b - 6)$

$$3) -3a(2a^2 + 5)$$

$$4) (x+2)(x+3)$$

$$5) (2b-5)(4b+3)$$

$$6) (y+3)^2$$

$$7) (x-3)(x^2 + 8x - 6)$$

$$8) \frac{3a^3b^4 - 12a^2b^3 + 6a^5b^7}{9ab^2}$$

Divide using synthetic division.

$$1) \frac{x^4 - 4x^3 + 2x^2 - 4x + 1}{x+1}$$

$$2) \frac{x^5 + 2x^2 - 4}{x-3}$$



Transformations

Assuming we use the parent function, $f(x)$, and the constant value C :

A) List the type of transformation performed

B) Tell which coordinate would be affected and how it would be affected

1) $f(x) + 5$

2) $f(x) - 6$

3) $f(x - 7)$

4) $f(x + 8)$

A)

A)

A)

A)

B)

B)

B)

B)

5) $f(-x)$

6) $-f(x)$

7) $2 \bullet f(x)$

8) $f(2x)$

A)

A)

A)

A)

B)

B)

B)

B)

List the transformations in the correct order. Then describe what will happen to the x and y coordinates as a result.

1) $-2f(x + 3) - 5$

Horizontal:

Vertical:

X's

Y's

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

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

Horizontal:

Vertical:

X's

Y's

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

$$3) \frac{1}{2}f(x-6)-3$$

Horizontal:

Vertical:

X's

Y's

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

$$4) -f(2x+5)$$

Horizontal:

Vertical:

X's

Y's

1) _____

1) _____

2) _____

2) _____

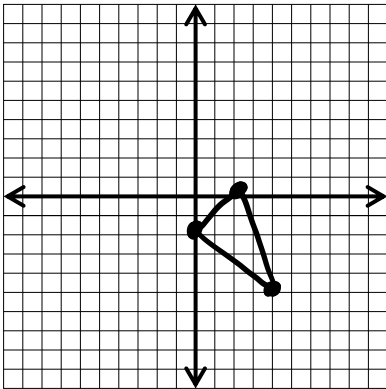
3) _____

3) _____

You have been given the graph of $f(x)$. Find the following information about the transformed graph:

- List the transformations in the correct order!
- Describe how each coordinate will be affected
- List the new points
- Graph the new function based on the given points

1)



Transformed function: $2f(x-1)+1$

A) Horizontal:

Vertical:

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

B) X's:

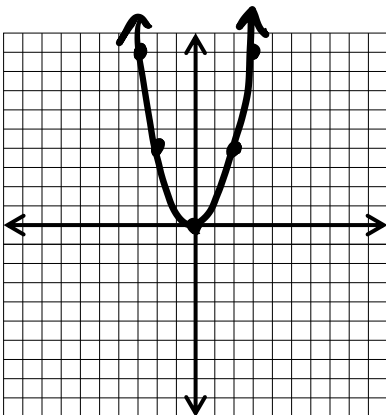
Y's:

C) Original Points

$(0, -2)$
 $(1, 0)$
 $(2, -5)$

New Points

2)



Transformed function: $-f(-2x)-1$

A) Horizontal:

Vertical:

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

B) X's:

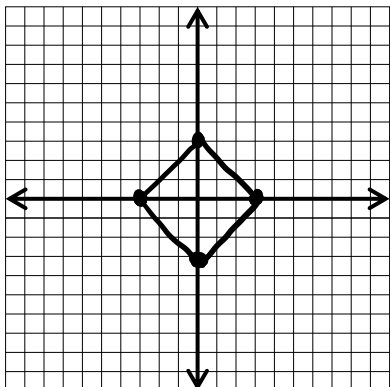
Y's:

C) Original Points

$(0, 0)$
 $(-2, 4)$
 $(-3, 9)$
 $(2, 4)$
 $(3, 9)$

New Points

3)



Transformed function: $2f\left(\frac{1}{2}x - 1\right) - 3$

A) Horizontal:

Vertical:

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

B) X's:

Y's:

C) Original Points

New Points

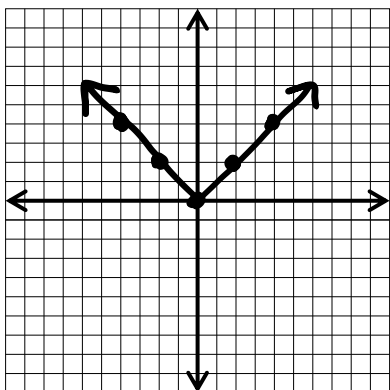
$(-3, 0)$

$(0, 3)$

$(3, 0)$

$(0, -3)$

4)



Transformed function: $-\frac{1}{2}f(3x + 5) + 1$

A) Horizontal:

Vertical:

1) _____

1) _____

2) _____

2) _____

3) _____

3) _____

B) X's:

Y's:

C) Original Points

New Points

$(0, 0)$

$(-2, 2)$

$(-4, 4)$

$(2, 2)$

$(4, 4)$