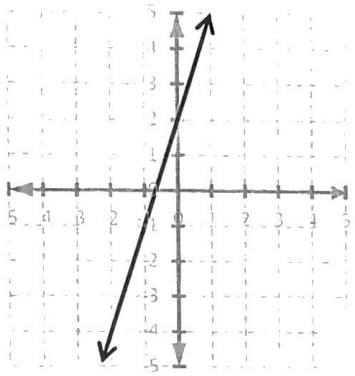
Name:_____ Teacher: _____ Hour:_____

Algebra 2A Final Exam Review

Describe the domain and range of each graph using inequality, set notation, and interval notation. Then describe the end behavior.

1.)



Domain:

Inequality _____

Set Notation _____

Interval Notation _____

Range:

Inequality _____

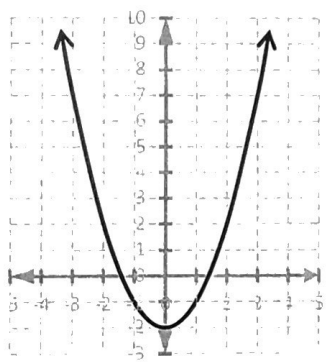
Set Notation _____

Interval Notation _____

End Behavior:

_____

2.)



Domain:

Inequality _____

Set Notation _____

Interval Notation _____

Range:

Inequality _____

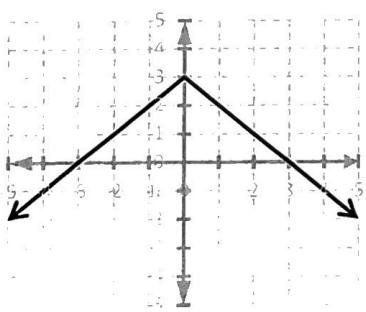
Set Notation _____

Interval Notation _____

End Behavior:

_____

3.)



Domain:

Inequality _____

Set Notation _____

Interval Notation _____

Range:

Inequality _____

Set Notation _____

Interval Notation _____

End Behavior:

_____

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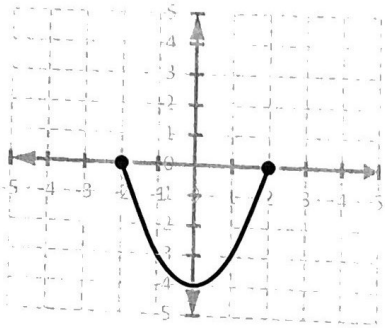
4.)



Domain:

Inequality _____

Set Notation _____

Interval Notation _____

Range:

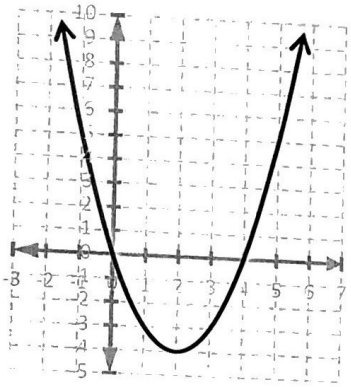
Inequality _____

Set Notation _____

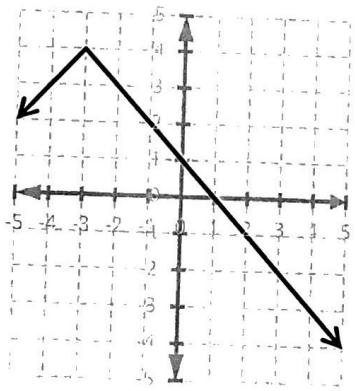
Interval Notation _____

5.) Identify the Axis of Symmetry and Vertex on the graphs below.

a.)



b.)



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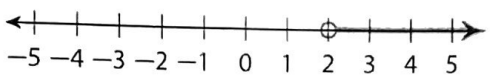
6.) Describe the intervals shown using inequality, set notation and interval notation.

a.)

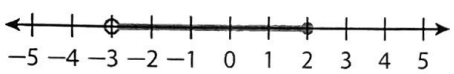


Inequality _____

Set Notation _____

Interval Notation _____

b.)



Inequality _____

Set Notation _____

Interval Notation _____

7.) Find the inverse of each function.

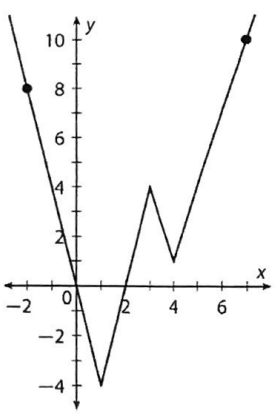
a.) $f(x) = 10 - 4x$

b.) $f(x) = 15x - 10$

8.) Using the graph to the right.

a.) On which interval(s) is the graph increasing?

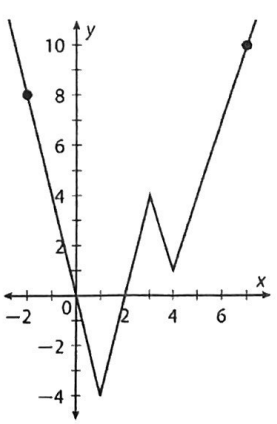
b.) On which interval(s) is the graph decreasing?



9.) Using the graph to the right.

a.) On which interval(s) is the graph negative?

b.) On which interval(s) is the graph positive?



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10.) John earns $30 per week for his allowance, plus $25 for each lawn he mows. He wants to earn at least $175 a week.
a.) Write an equation to represent the situation.

b.) How many lawns must he mow to reach his goal?

11.) Joy earns $20 per week for her allowance, plus $15 for each SHIPT order she fills. She wants to earn at least $320 a week.
a.) Write an equation to represent the situation.

b.) How many SHIPT orders must she fill to reach her goal?

12.) Solve the following absolute value equations
a.) $2|x - 5| - 4 = 2$

b.) $3|x + 2| = 12$

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13.) Determine the number of solutions of each of the following absolute value equations.

a.) $3|2x + 7| + 6 = 15$

b.) $9|4x + 9| + 3 = 3$

c.) $4|6x - 5| + 12 = 8$

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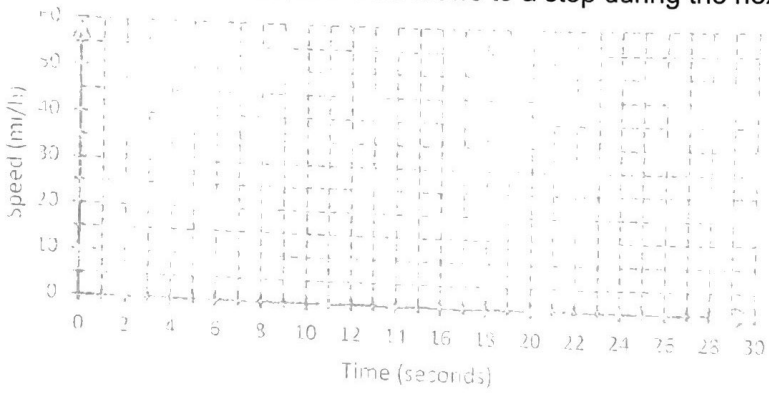
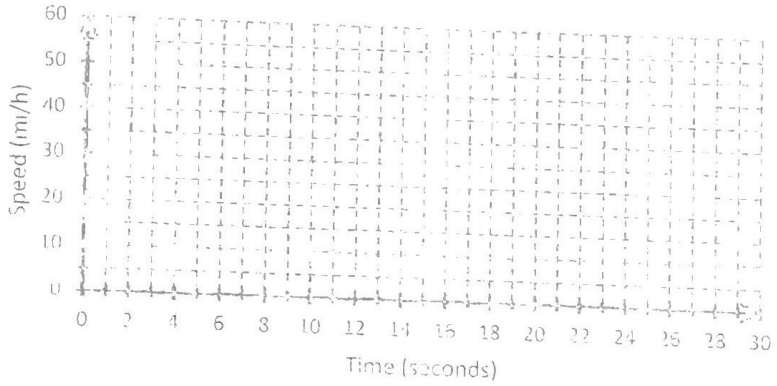
14.) Graph each situation below.

a.) A car travelling at 25 mi/h accelerates to 50 mi/h in 10 seconds. It maintains that speed for the next 10 seconds, and then slows to a stop during the next 10 seconds.



b.) A car travelling at 5 mi/h accelerates to 15 mi/h in 3 seconds. It maintains that speed for the next 2 seconds. Then the car accelerates again to 25 mi/h in 5 seconds. It stays this speed for 3 seconds, and then slows to a stop during the next 7 seconds.



15.) Compare each of the following graphs with the graph of $f(x) = x^2$

a.) $g(x) = x^2 + 5$

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

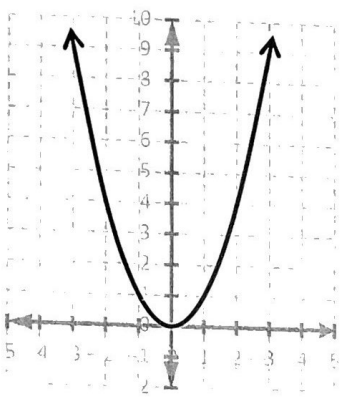
c.) $g(x) = (x + 3)^2$

d.) $g(x) = 4x^2$

e.) $g(x) = (x - 5)^2$

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

g.) $g(x) = \frac{1}{3}x^2$



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16.) If $f(x) = |x|$ write a function $g(x)$ that is reflected over the x-axis vertically compressed by a factor of $\frac{1}{3}$ translated 4 units left and down 2 unit.

17.) If $f(x) = |x|$ write a function $g(x)$ that is vertically stretched by a factor of 7 translated 8 units right and up 5 units.

18.) If $f(x) = x^2$ write a function $g(x)$ that is reflected over the x-axis vertically stretched by a factor of 4 translated 2 units right and up 6 units.

19.) If $f(x) = x^2$ write a function $g(x)$ that is vertically compressed by a factor of $\frac{1}{4}$ translated 5 units left and down 1 unit.

20.) Identify the transformations of the graph from the parent function $f(x) = |x|$.

$$g(x) = 3|x + 7| - 2$$

21.) Identify the transformations of the graph from the parent function $f(x) = |x|$.

$$g(x) = \frac{3}{4}|x - 6| + 4$$

22.) Identify the transformations of the graph from the parent function $f(x) = x^2$.

$$g(x) = -2(x - 2)^2 + 7$$

23.) Identify the transformations of the graph from the parent function $f(x) = x^2$.

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

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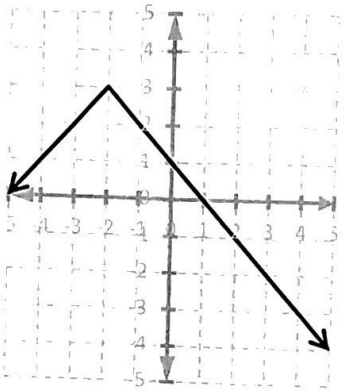
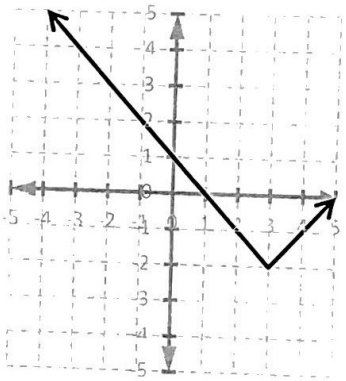
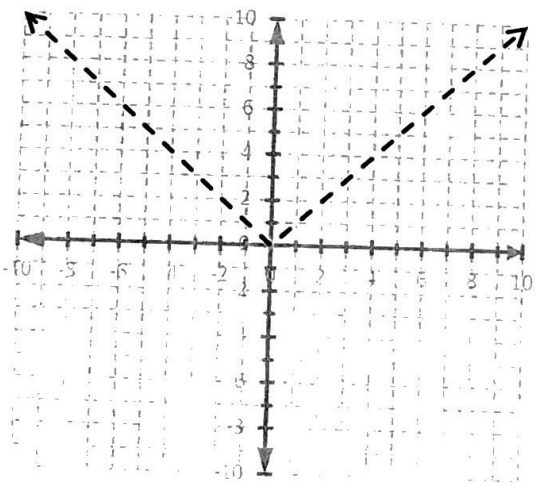
24.) What is the equation of $g(x)$ in vertex form $g(x) = a|x - h| + k$.



25.) What is the equation of $g(x)$ in vertex form $g(x) = a|x - h| + k$.



26.) Graph $g(x) = |x - 5|$. Compare it with the graph of $f(x) = |x|$.
The dashed line is $f(x) = |x|$



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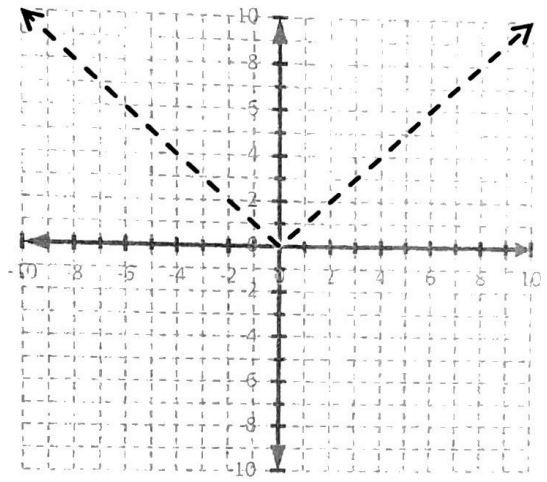
27.) Graph $g(x) = |x| - 3$. Compare it with the graph of $f(x) = |x|$.
The dashed line is $f(x) = |x|$



28.) Solve the equation $(x - 9)^2 = 16$

29.) Solve the equation $(x - 16)^2 = 25$

30.) Solve the equation $(2x - 3)^2 = 113$

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31.) Solve the equation $(4x - 5)^2 = 97$

32.) What does the imaginary unit i represent?

33.) Solve the equation $9x^2 - 65 = -1$

34.) Solve the equation $16x^2 - 30 = -5$

35.) Solve the equation $2x^2 + 47 = 15$

36.) Solve the equation $2x^2 + 148 = 20$

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37.) On Venus, the distance *d* (in feet) that an object falls in time *t* (in seconds) can be modeled by the function $d(t) = 12t^2$. How long would it take an object to fall 108 feet on Venus?

38.) On Venus, the distance *d* (in feet) that an object falls in time *t* (in seconds) can be modeled by the function $d(t) = 5t^2$. How long would it take an object to fall 125 feet on Venus?

39.) A soccer player uses her head to hit a ball up in the air from a height of 2 meters with an initial velocity of 10 meters per second. The height *h* in meters of the ball is given by $h(t) = -4.9t^2 + 10t + 2$, where *t* is the time elapsed in seconds. Use the discriminant (D) to see if the ball will go up, and come back down to height of 1.5 meters. Explain why.

40.) In the past, professional baseball was played at the Astrodome in Houston, Texas. The Astrodome has a maximum height of 63.4 m. The height in meters of a baseball *t* seconds after it is hit straight up in the air with a velocity of 45 m/s is given by $h = -9.8t^2 + 45t + 1$. Will a baseball hit straight up with this velocity hit the roof of the Astrodome?

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41.) Determine if each quadratic equation has real or non-real solutions

a.) $x^2 - 3x + 8 = 0$

b.) $-2x^2 + 3x - 1 = 0$

c.) $3x^2 + 6x + 3 = 0$

42.) Solve $3x^2 + 11x + 5 = 0$ using the quadratic formula

43.) Solve $2x^2 + 9x + 4 = 0$ using the quadratic formula

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44.) Complete the square for the following expression then write it as a binomial squared

$x^2 - 6x + \_\_\_\_\_ = (\_\_\_\_\_)^2$

45.) Complete the square for the following expression then write it as a binomial squared

$x^2 + 8x + \_\_\_\_\_ = (\_\_\_\_\_)^2$

46.) Write the equation that shows $x^2 + 16x + 7 = 0$ after the method of completing the square has been applied? (DON'T SOLVE)

47.) Write the equation that shows $x^2 - 6x + 10 = 0$ after the method of completing the square has been applied? (DON'T SOLVE)

48.) Solve $x^2 - 4x = -1$ by completing the square.

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49.) Solve $x^2 - 2x = 4$ by completing the square.

50.) Write the following function in vertex form and identify the vertex. $g(x) = x^2 + 8x - 10$

51.) Write the following function in vertex form and identify the vertex. $g(x) = x^2 - 6x + 15$

52.) What value should be added in the blanks to complete the square?

$$[x^2 + 6x + \_\_\_\_\_] + [y^2 + 4y + \_\_\_\_\_] = -20 + \_\_\_\_\_ + \_\_\_\_\_$$

53.) What value should be added in the blanks to complete the square?

$$[x^2 - 2x + \_\_\_\_\_] + [y^2 + 6y + \_\_\_\_\_] = -15 + \_\_\_\_\_ + \_\_\_\_\_$$

54.) Write the equation of a circle with center $C(4, -3)$ and radius $r = 4$

55.) Write the equation of a circle with center $C(-2, 8)$ and radius $r = 6$

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56.) What is the center and radius of the circle? $(x-4)^2+(y+3)^2=49$.

57.) What is the center and radius of the circle? $(x+6)^2+(y-2)^2=16$.

58.) Find the radius of a circle with center $C(2,2)$ and passes through the point $P(-1,6)$

59.) Find the radius of a circle with center $C(2,-1)$ and passes through the point $P(4,4)$

60.) Write the equation in the standard form of a circle. $x^2+y^2+4x-4y-1=0$.

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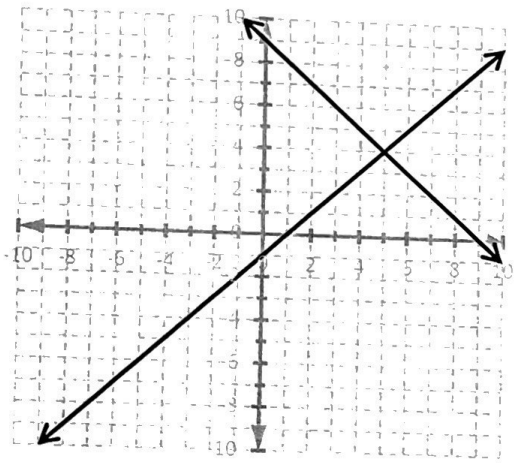
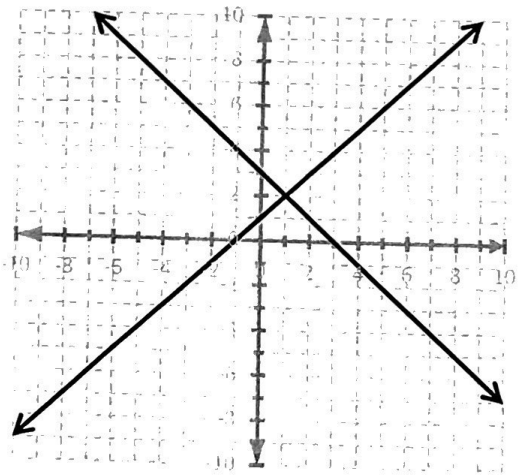
61.) Write the equation in the standard form of a circle. $x^2 + y^2 - 10x + 6y + 30 = 0$.

62.) What is the solution to the system graphed?



63.) What is the solution to the system graphed?



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64.) What is the solution to the system of equations?

$$\begin{cases} y = -2x + 8 \\ y = x - 7 \end{cases}$$

65.) What is the solution to the system of equations?

$$\begin{cases} y = x - 2 \\ y = 4x + 1 \end{cases}$$

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66.) Determine the number of solutions for each of the systems of equations

a.) $\begin{cases} x + y = 4 \\ -x - y = 6 \end{cases}$

b.) $\begin{cases} x - 4y = 12 \\ x + 5y = 3 \end{cases}$

c.) $\begin{cases} x - 3y = 6 \\ 4x - 12y = 24 \end{cases}$

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67.) Solve the system of equations by substitution

$$\begin{cases} x^2 - y = 7 \\ x - y = 7 \end{cases}$$

68.) Solve the system of equations by substitution

$$\begin{cases} x^2 = y + 7 \\ 6x + y = -16 \end{cases}$$

69.) A jar containing only nickels and dimes contains a total of 30 coins. The value of the coins in the jar is $2.00. Solve by elimination to find the number of nickels and dimes that are in the jar.

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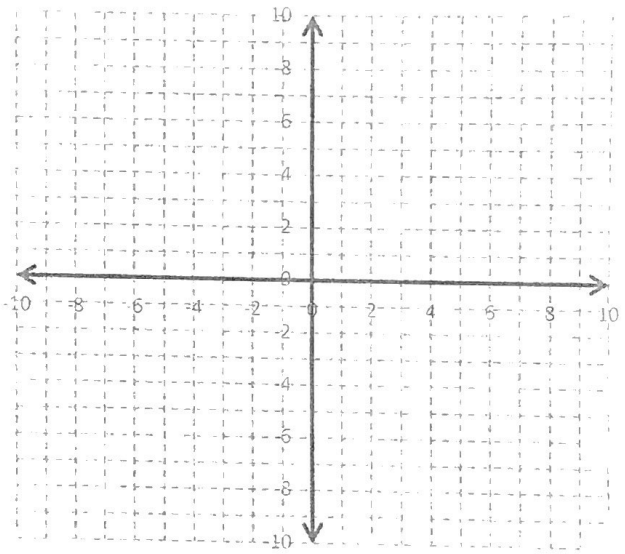
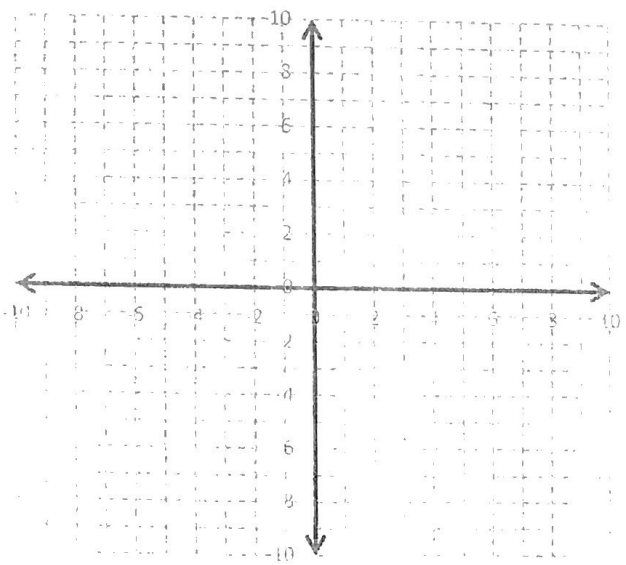
70.) A jar containing only nickels and dimes contains a total of 80 coins. The value of the coins in the jar is $6.75. Solve by elimination to find the number of nickels and dimes that are in the jar.

71.) Graph the circle. $(x-2)^2+(y+4)^2=16$



72.) Graph the circle. $(x+1)^2+(y-3)^2=25$



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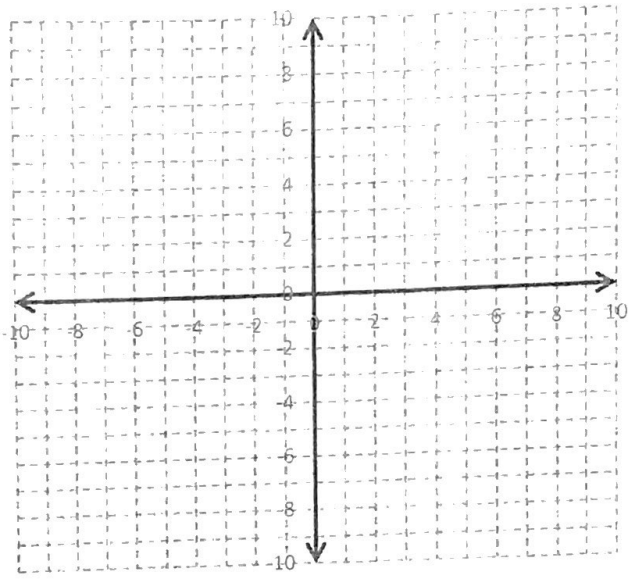
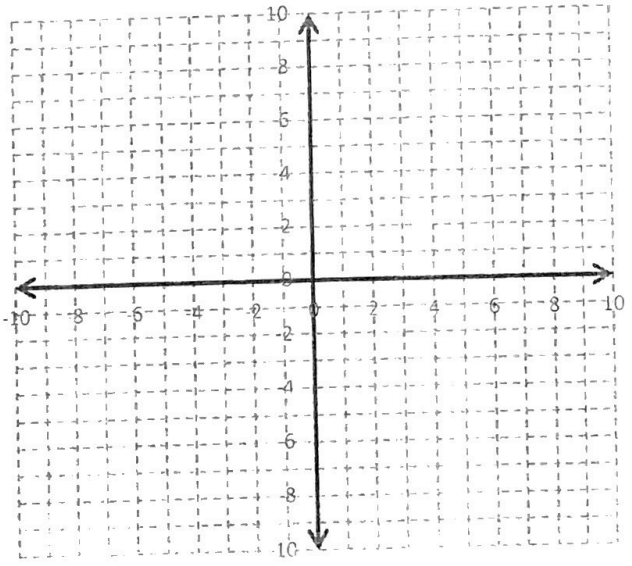
73.) Graph the absolute value function $g(x) = 2|x + 2| + 3$



74.) Graph the absolute value function $g(x) = \frac{3}{4}|x - 5| - 2$



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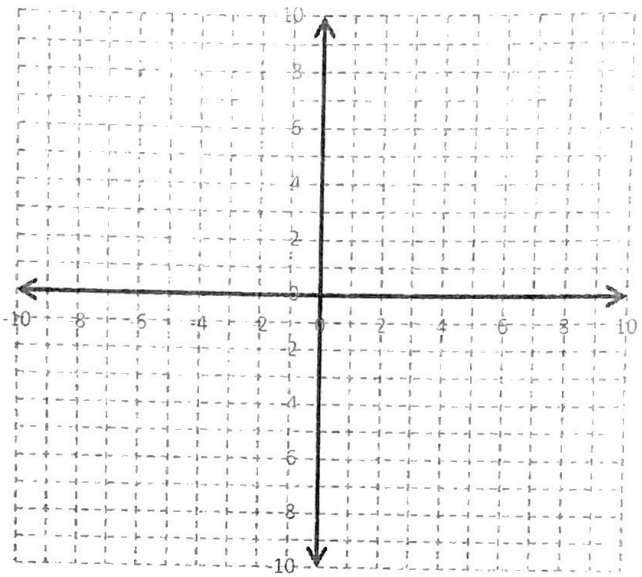
75.) Graph the quadratic function $g(x) = -2(x+2)^2 + 8$



76.) Graph the quadratic function $g(x) = 2(x-3)^2 - 2$