Algebra 1 R Ten Day Countdown

DAY	Major Content Emphasis
	Seeing Structure in Expressions **-Interpret the Structure of Expressions**
1	**A-SSE.1** Interpret expressions that represent a quantity in terms of its context.★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret P(1+r)n as the product of P and a factor not depending on P.* **A-SSE.2** Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.*
	Arithmetic with Polynomials and Rational Expressions **-Perform arithmetic operations on polynomials.**
2	**A-APR.1** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
	Creating Equations - **Create equations that describe numbers or relationships.**
3-4	**A-CED.1** Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions*.★ **A-CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ **A-CED.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods*.★ **A-CED.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R*.★
	Reasoning with Equations and Inequalities -**Understand solving equations as a process of reasoning and explain the reasoning.** **-Solve equations and inequalities in one variable.** **-Represent and solve equations and inequalities graphically.**
5-6	A-REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

	A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. A-REI.4 Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in *x* into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers *a* and *b*. A-REI.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). A-REI.11 Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★ A-REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
	Interpreting Functions **-Understand the concept of a function and use function notation.** **- Interpret functions that arise in application in terms of the context.**
7-8	F-IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then $f(x)$ denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation $y = f(x)$. F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. F-IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ *for* $n \geq 1$. F-IF.4 For a function that models a relationship between two quantities, interpret key features of graphs

	and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*★ F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* ★ F-IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
9-10	**6 Point Questions**

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Algebra I Review:

Day 1

A-SSE.1: Interpret expression that represents a quantity a quantity in terms of its context.★

a. Interpret parts of an expression, such as terms, factors, and coefficients.

b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret P(1 + r)n as the product of { and a factor not depending on P.*

A-SSE.2: Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares than can be factored as $(x^2 - y^2)(x^2 + y^2)$.

<table>
<tr><td>
You do:
The “Bulbs on the Bay” Holiday drive-through attraction charges $12 per car plus $1 for every individual, (p), in the car. Which choice represents the total cost (c) per car?
1. c = p + 12
2. c = 12(p + 1)
3. c = 12p + 1
4. c = 1•(12p)
</td><td rowspan="3">Notes</td></tr>
<tr><td>
You do:
In the expression $5x^3 - 4x^2 + 2x + 3$, what is the coefficient of the cubic term?
1. -4 3. -3
2. 2 4. 5
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You do:
Express the total weight, (p), of a filled animal watering pail, if the pail weighs 12 pounds and the water weighs 8.3 pounds per gallon? Let gallons = g.
1. $p = (8.3)(12)$
3. $p = 8.3g - 12$
2. $p = 8.3g + 12$
4. $p = 12g + 8.3$

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We do:	Notes
Assume b represents the number of boys and g represents the number of girls in a classroom. We know that there is at least one boy and one girl, and there are more girls than boys. **Which expression would have a larger value?** 1. $\frac{g-b}{2}$ 2. $\frac{b-g}{2}$ 3. There is not enough information to tell. 4. Both expressions are equal	
You do: The only animals in a pet store are dogs and cats. Assume c represents the number of cats and d represents the number of dogs. We know that there is at least one of each and that there are more dogs than cats. Which expression would have a smaller value? 1. $\frac{d}{c+d}$ 2. 0.5 3. There is not enough information to tell. 4. The expressions are equal	
We do: Factor 1. $m^2 - 12m + 36$ 2. $x^2 - 2x - 15$	

You do:	Notes
1. The expression of $64 – x^4$ is equivalent to which other expression? 1. $(8 - x^2)(8 - x^2)$ 3. $(x^2 – 8)(x^2 – 8)$ 2. $(8 - x^2)(8 + x^2)$ 4. $(x^2 – 8)(x^2 + 8)$ 2. $6x^2 - 5x - 4$ is equivalent to: 1. $(6x - 1)(x + 4)$ 3. $(x - 1)(6x - 4)$ 2. $(3x - 1)(2x - 4)$ 4. $(2x + 1)(3x - 4)$	
We do: A store sells N refrigerators at a price of \$x and then discounts the product and sells M of the same refrigerators at a price of \$y. What quantity does the following expression represent? $$\frac{xN + yM}{N + M}$$ 1. the number of refrigerators sold 3. the average number of the refrigerators sold 2. the revenue of the store 4. the average price of the refrigerators sold	
Summary:	

Name: ____Date: ____________________

Algebra I Review:

Day 2

A-APR.1: Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

You do:	Notes
1) Simplify the following: a) $(a^2 - 3a) + (3a^2 + 4a)$ b) $(2x^3y^2)(-4x^4y)$ c) $-2(x + 5) - 7(x - 2)$ 2) Use the exponent rules to simplify the following: a) $y^9 \bullet y^3$ b) $6cb^6 \bullet -4c^4b^2$ c) $(2c^4)^2$ d) $8(x - 1) + 2(x + 2)$ e) $\left(\frac{5}{6}\right)^{-2}$ f) $(14m)^0$	

Simplify the following:

a) $(3y^2 + 2y) + (4y^2 + 5y)$

b) $(4w^3 + 6w - 5) + (2w^2 - 4w + 7)$

c) $-b(2b - 7)$

d) $5(2a^2 - 6a + 7)$

e) $(x + 2)(x - 6)$

f) $(c + 2)(c^2 - 2c + 5)$

You do:	
1) What is the result when you subtract $3a^2 - 3a + 7$ from $2a^2 + 3a - 5$? 2) Which of the following equations is equivalent to $x^2 - 4x - 13 = 0$? 1. $(x - 2)^2 = 13$ 3. $(x - 4)^2 = 13$ 2. $(x - 2)^2 = 17$ 4. $(x - 4)^2 = 17$	
We do: $6x^2 - 5x - 4$ is equivalent to: 1. $(6x - 1)(x + 4)$ 3. $(x - 1)(6x - 4)$ 2. $(3x - 1)(2x - 4)$ 4. $(2x + 1)(3x - 4)$	Notes

We do:

Given the polynomials P(x) and Q(x) below

$P(x) = x^3 + 3x^2 - 1$
$Q(x) = -2x^2 - x + 4$

R(x) = P(x) + Q(x) is equivalent to which of the following?

1. $R(x) = x^3 + x^2 - 2 + 3$
2. $R(x) = x^3 + x^2 - x + 5$
3. $R(x) = x^3 + x^2 - x + 3$
4. $R(x) = x^3 + x^2 + x$

You do:

Given the polynomials P(x) and Q(x) below,

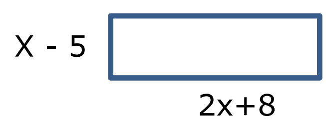
$P(x) = x^2 - x$
$Q(x) = x - 3$

$R(x) = P(x) \cdot Q(x)$ is equivalent to which of the following?

1. $R(x) = x^3 + 2x^2 + 3x$
2. $R(x) = x^3 - 4x^2 - 3x$
3. $R(x) = x^3 - 2x^2 + 3x$
4. $R(x) = x^3 - 4x^2 + 3x$

Summary:

Find the area of the rectangle in simplest form:



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Algebra I Review:

Day 3 and Day 4

A-CED.16

Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.★

A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★

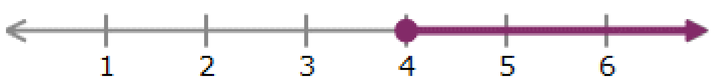
A-CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★

A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.★

We do:

Notes

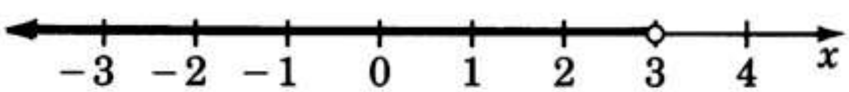
What inequality does this number line show?



Write your answer starting with x (for example, x < 3).

You do:

What inequality does this number line show?



1) 2x + 7 < 1
2) -2x + 7 < 1
3) -2x + 7 > 1
4) 2x + 7 > 1

We do:

Notes

Look at this table:

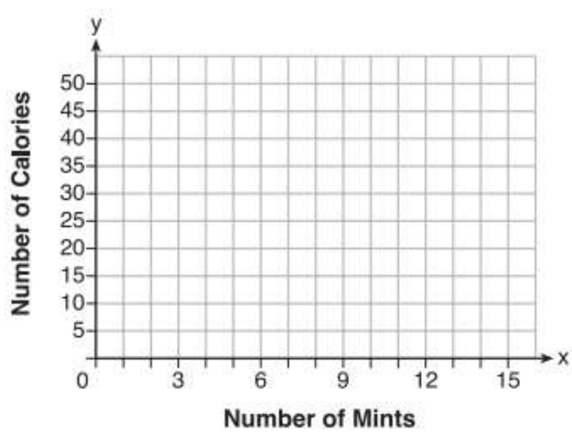
x	y
4	48
5	75
6	108
7	147
8	192

Write a linear ($y = mx + b$), quadratic ($y = ax^2$), or exponential ($y = a(b)^x$) function that models the data.

You do:

Max purchased a box of green tea mints. The nutrition label on the box stated that a serving of three mints contains a total of 10 Calories.

On the axes below, graph the function, C, where $C(x)$ represents the number of Calories in x mints.



Write an equation that represents $C(x)$.

A full box of mints contains 180 Calories. Use the equation to determine the total number of mints in the box.

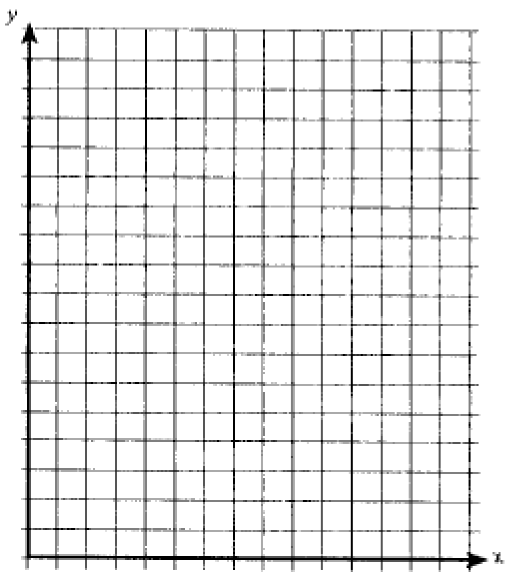
We do:	Notes
The product of 16 and 4 less than a number is 208. Find the number.	
You do: Ashlee has already taken 1 page of notes on her own, and she will take 3 pages during each hour of class. After attending 2 hours of class, how many total pages of notes will Ashlee have in her notebook? Write and solve an equation to find the answer.	
You do: Identify the slope in the equation. $x-\frac{1}{2}=3x-x+y$ (1) -2 (2) -1 (3) ½ (4)- ½	
We do:	Notes

Create a scatter plot to demonstrate the relationship between the snow storms this year and the average amount of salt used on the roads in town.

a) Sketch a line or curve of best fit.

b) Determine a function to define it.

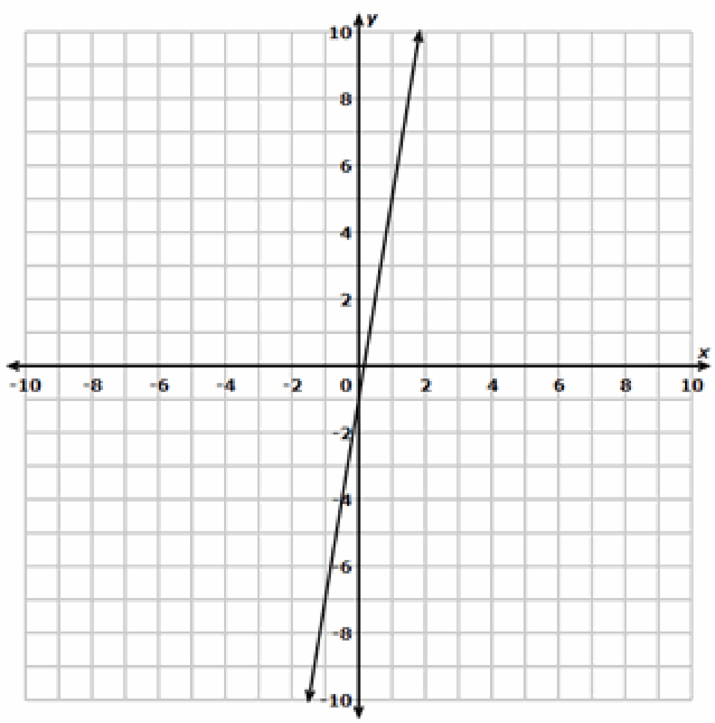
Snow storm	Salt (pounds)
1	3
2	4
3	8
4	10
5	15



You do:

Notes

Look at this graph.



What is the equation of the line in slope-intercept form?

Write your answer using integers, proper fractions, and improper fractions in simplest form.

We do: Notes

David has two jobs. He earns $8 per hour babysitting his neighbor's children and he earns $11 per hour working at the coffee shop.

Write an inequality to represent the number of hours, x, babysitting and the number of hours, y, working at the coffee shop that David will need to work to earn a minimum of $200.

David worked 15 hours at the coffee shop. Use the inequality to find the number of full hours he must babysit to reach his goal of $200.

You do:

A high school drama club is putting on their annual theater production. There is a maximum of 800 tickets for the show. The costs of the tickets are $6 before the day of the show and $9 on the day of the show. To meet the expenses of the show, the club must sell at least $5,000 worth of tickets.

a) Write a system of inequalities that represent this situation.

b) The club sells 440 tickets before the day of the show. Is it possible to sell enough additional tickets on the day of the show to at least meet the expenses of the show? Justify your answer.

You do:	Notes
Jonathan has been on a diet since January 2013. So far, he has been losing weight at a steady rate. Based on monthly weigh-ins, his weight, *w*, can be modeled by the function $w = -3m + 205$, where *m* is the number of months after January 2013. a) How much did Jonathan weigh at the start of the diet? b) How much weight has Johnathan been losing each month? c) How many months did it take Jonathan to lose 45 pounds?	
You do: 3. The formula for converting degrees Celsius to Fahrenheit is $F = \frac{9}{5}C + 32$. Which expression is correctly written to convert Fahrenheit temperatures into degrees Celsius? (1) $C = \frac{9}{5}F + 32$ (2) $C = \frac{5}{9}F - 160$ (3) $C = \frac{5F - 160}{9}$ (4) $C = 32F + 160$	

Summary:

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Day 5

A-REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A-REI.4 Solve quadratic equations in one variable.
a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p) 2 = q that has the same solutions. Derive the quadratic formula from this form.
b. Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.

	Notes
We do: 1. Solve for x and name the properties used: $\frac{3}{4}(x+2)=6(x+12)$	
You do: 2. Solve for x and name the properties used: $3(5-5x)>5x$	

We do:	Notes
3. The equation $A = P + Prt$ relates the amount of money in an account, A, with the principal amount invested P, simple interest rate r, and length of the investment, t. Solve this literal equation for P.	
You do: 4. The formula $F = \frac{9}{5}C + 32$ gives the temperature in degrees Fahrenheit if you know the temperature in degrees Celsius. What is the formula for C in terms of F? Use the formula to convert 86° Fahrenheit to Celsius.	
We do: 5. Brian correctly used a method of completing the square to solve the equation $x^2 + 7x - 11 = 0$. Brian's first step was to rewrite the equation as $x^2 + 7x = 11$. He then added a number to both sides of the equation. Which number did he add? (1) $\frac{7}{2}$ (3) $\frac{49}{2}$ (2) $\frac{49}{4}$ (4) 49	
You do: 6. If $x^2 + 2 = 6x$ is solved by completing the square, an intermediate step would be (1) $(x+3)^2 = 7$ (3) $(x-3)^2 = 11$ (2) $(x-3)^2 = 7$ (4) $(x-6)^2 = 34$	

We do:

7. Solve $8m^2 + 20m = 12$ for *m* by factoring.

Notes

You do:

8. Solve: $6x^2 - 6 = 9x$ by factoring.

Now use Quadratic Formula to verify your answer.

Mixed Review:

1. Solve for x: $x + 6x + 49 = 2(5x + 59)$

2. The equation $3x + 4 = 5x - 4$ has the solution set $\{4\}$.
   Explain why the equation $(3x + 4) + 4 = (5x - 4) + 4$ also has the solution set $\{4\}$.

3. Which ordered pair is *not* in the solution set of $y > -\frac{1}{2}x + 5$ and $y \leq 3x - 2$?
   (1) (5, 3)
   (2) (4, 3)
   (3) (3, 4)
   (4) (4, 4)

4. Write the equation $y = x^2 - 10x + 4$ in vertex form.

5. If the quadratic formula is used to find the roots of the equation $x^2 - 6x - 19 = 0$, the correct roots are

(1) $3 \pm 2\sqrt{7}$

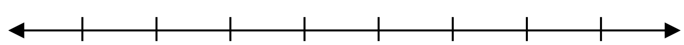
(2) $-3 \pm 2\sqrt{7}$

(3) $3 \pm 4\sqrt{14}$

(4) $-3 \pm 4\sqrt{14}$

6. The surface area of an object is the total area of its surfaces. For example, a cylinder has a top, bottom, and sides. The top and bottom are circles and the side is a rectangle when opened up. The formula to find the surface area, S, of a cylinder is $S = 2\pi r^2 + 2\pi rh$. Solve the equation for h.

7. Valley Video charges a $15 annual membership fee plus $3 for each movie rental. Tanya puts aside $100 for renting movies for the year. How many movies can Tanya rent from Valley Video? Use an inequality to solve this problem. Graph your solution on the number line and explain the meaning of your graph in a sentence.



8. What is the larger root of the equation $x^2 - 10x + 21 = 0$.

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Day 6

A-REI.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A-REI.11 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★

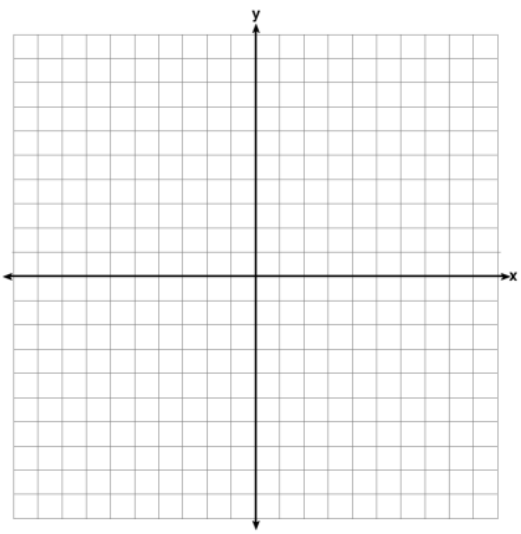
A-REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

We do:

1. On the set of axes below, solve the following system of inequalities graphically. State the coordinates of a point in the solution set.

$$y < 2x + 1$$

$$y \geq -\frac{1}{3}x + 4$$

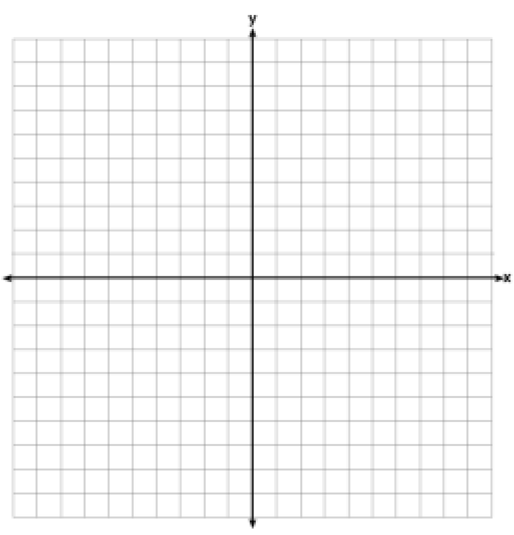


You do

2. On the set of axes below, graph the following system of inequalities and state the coordinates of a point in the solution set.

$$2x - y \geq 6$$

$$x > 2$$



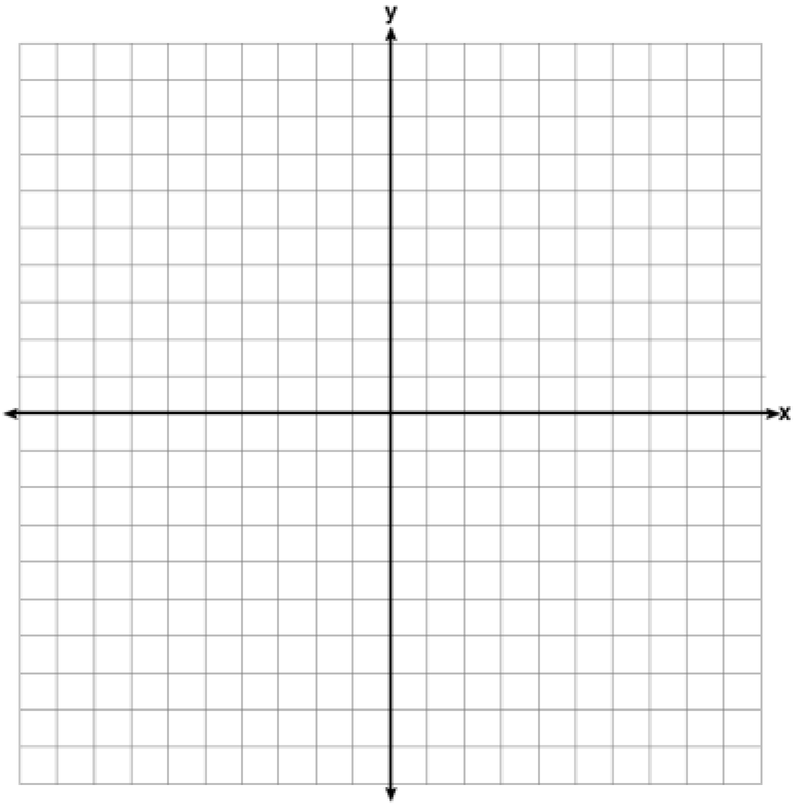
We do:

3. The sum of two numbers is 25. What are the numbers?

   a. **Create an equation using two variables to represent this situation. Be sure to explain the meaning of each variable**.

   b. List at least 3 solutions to the equation you created in part (a).

   c. Create a graph that represents the solution set to the equation.



You do:

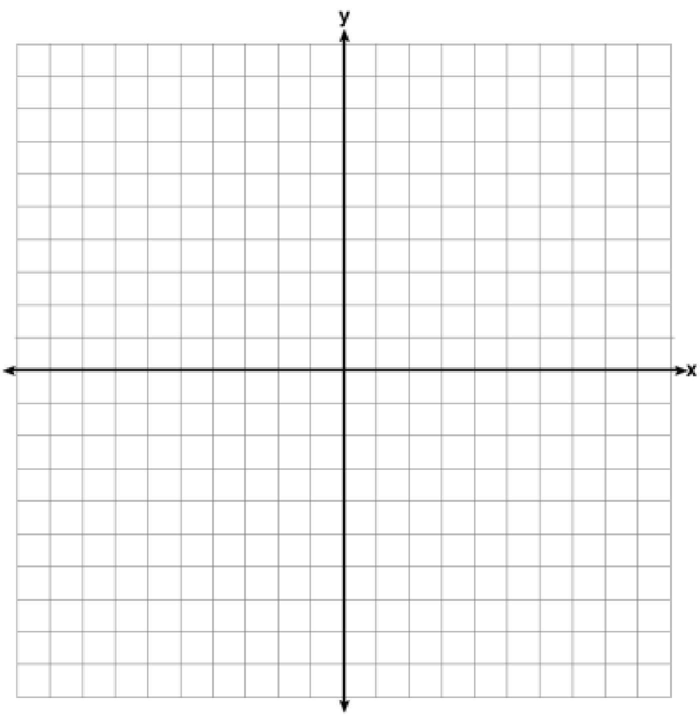
4. a. The Math Club sells hot dogs at a school fundraiser. The club earns \$108 and has a combination of five-dollar and one-dollar bills in its cash box. Complete the table below to verify that these are possible combinations of bills totaling \$108.

Number of five-dollar bills	Number of one-dollar bills	Total = \$108
19	13	$5(19) + 1(13) = 108$
16	28	
11	53	
4	88	

b. Find one more combination of ones and fives that totals \$108 .

c. Write **an equation using two variables to represent this situation. Be sure to explain the meaning of each variable**.

d. Create a graph that represents the solution set to the equation.



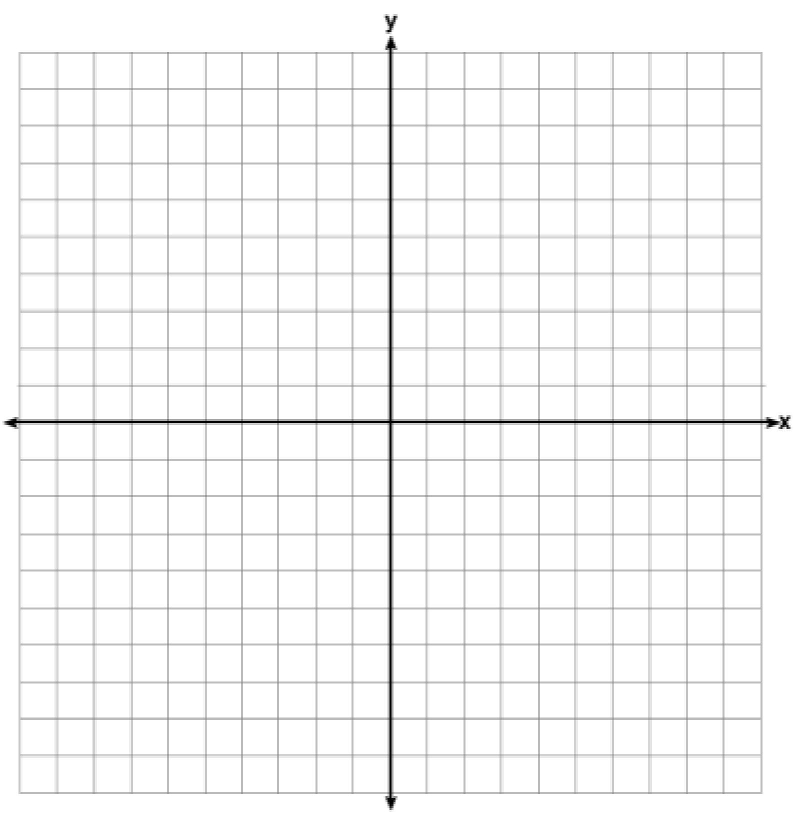
Mixed Review:

1. Next weekend Marnie wants to attend either carnival *A* or carnival *B*. Carnival *A* charges \$6 for admission and an additional \$1.50 per ride. Carnival *B* charges \$2.50 for admission and an additional \$2 per ride.

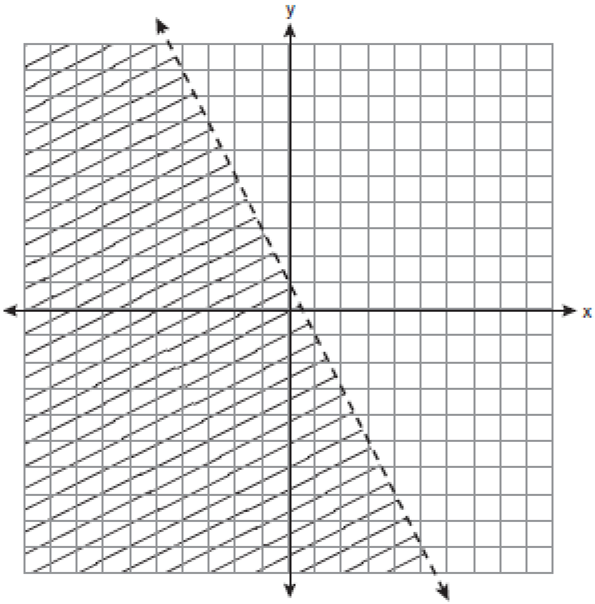
a) In function notation, write A(x) to represent the total cost of attending carnival *A* and going on x rides. In function notation, write B(x) to represent the total cost of attending carnival *B* and going on x rides.

b) Determine the number of rides Marnie can go on such that the total cost of attending each carnival is the same. [Use of the set of axes below is optional.]

c) Marnie wants to go on five rides. Determine which carnival would have the lower total cost. Justify your answer.



2. Which inequality is represented by the graph below?



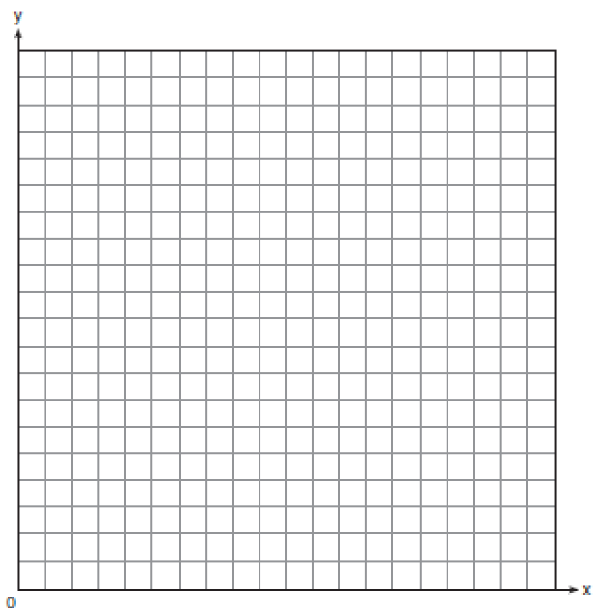
1) $y < 2x + 1$

2) $y < -2x + 1$

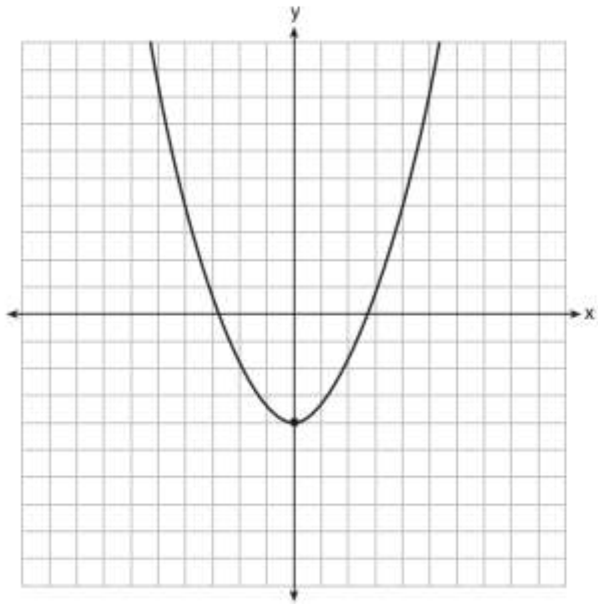
3) $y < \frac{1}{2}x + 1$

4) $y < -\frac{1}{2}x + 1$

3. An architect is designing a museum entranceway in the shape of a parabolic arch represented by the equation $y = -x^2 + 20x$, where $0 \leq x \leq 20$ and all dimensions are expressed in feet. On the accompanying set of axes, sketch a graph of the arch and determine its maximum height, in feet.



4. Ryker is given the graph of the function $y = \frac{1}{2}x^2 - 4$. He wants to find the zeros of the function, but is unable to read them exactly from the graph.



Find the zero's in simplest radical form.

Name: ____ Date: ____________________

F-IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F-IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n–1) for n ≥ 1.
F-IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★
F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★
F-IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★

Day 7 and Day 8

We do: | Notes

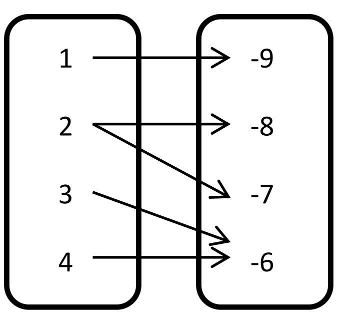
1) Are the following relations functions? Answer **YES** or **NO** then **explain your answer**.

a. {(2, 4), (3, 6), (4, 8), (5, 10), (6, 8)}

b.

x	6	7	8	6
y	1	2	3	4

c.



2) Find the average rate of change between *f(-4)* and *f(-1)* in the function $f(x) = x^2 + 2x - 8$

1. -9
2. -3
3. 3
4. 9

You do:

1) What is the domain for the function $\sqrt{x+2} - 2x$?

1. [0, -2)
2. (0,∞)
3. [-2,∞)
4. [2, ∞)

2) Which relation is a function?

1. *{(0,1), (0,2), (0,3), (0,4)}*
2. *{(3,4), (4,3), (5,6), (6,5)}*
3. *{(1,5), (2,6), (3,7), (3,8)}*
4. *{(1,1), (4,4), (1,4), (4,1)}*

3) What is the average rate of change from Day 1 to Day 13 of the function represented to the right?

1. $2°C$
2. $\frac{1}{2}°C$
3. $6°C$
4. $3°C$

Day	Temperature
1	$16°C$
4	$22°C$
7	$28°C$
10	$34°C$
13	$40°C$

We do:	Notes
1) Jeff bought a new car that costs $ 10,450. He knows this car's value will decrease by 20% each year. Jeff writes the following function to model the cost of the car after *t* years: $C(t) = 10{,}450(.80)^t$. If Jeff plans to sell the car after five years, what will be the value of the car at that time, to *the nearest dollar*? 2) A small country in Europe has been experiencing population growth that can be modeled by the equation $y = 120{,}000(1.042)^x$ where y is the population of the country and x is the number of years since 2010. What is the percent change in the population if the country each year?	

You do:

1) In 1980, the population of Detroit, Michigan was approximately 1,200,000. If the population decreased at an annual rate of 14.6% over the next decade, what was the population of Detroit in 1990, 10 years later?

2) Joseph conducted a science experiment involving the growth of bacteria. He measured the number of bacteria hourly for 6 hours. The data is summarized in the accompanying table. What type of regression would best fit the data?

1. Linear
2. Exponential
3. Quadratic
4. Absolute Value

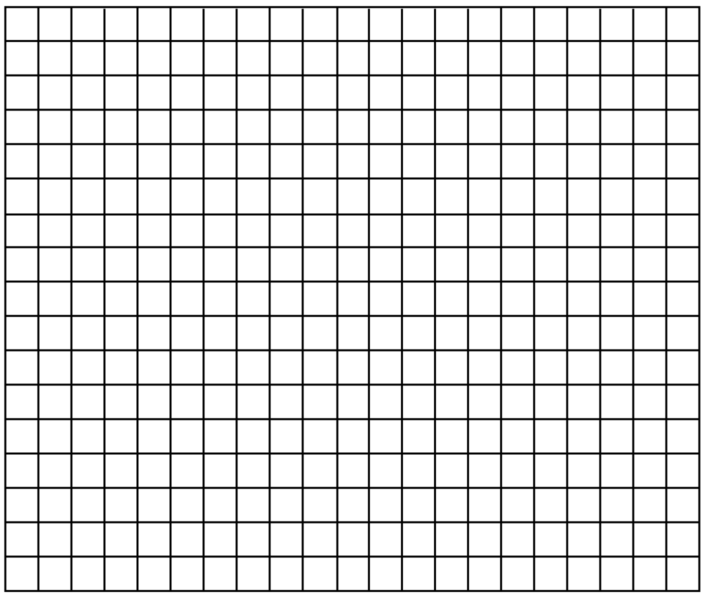
Hour	*Number of Bacteria*
0	300
1	470
2	725
3	1150
4	1800
5	2750
6	4400

3) Mark has invested $25 into an account that doubles every year. Complete the table below to show how much money Mark will have in the account each year for the first 6 years.

Year	0	1	2	3	4	5	6
Money in Account	25						

a. Write an equation that represents this situation.

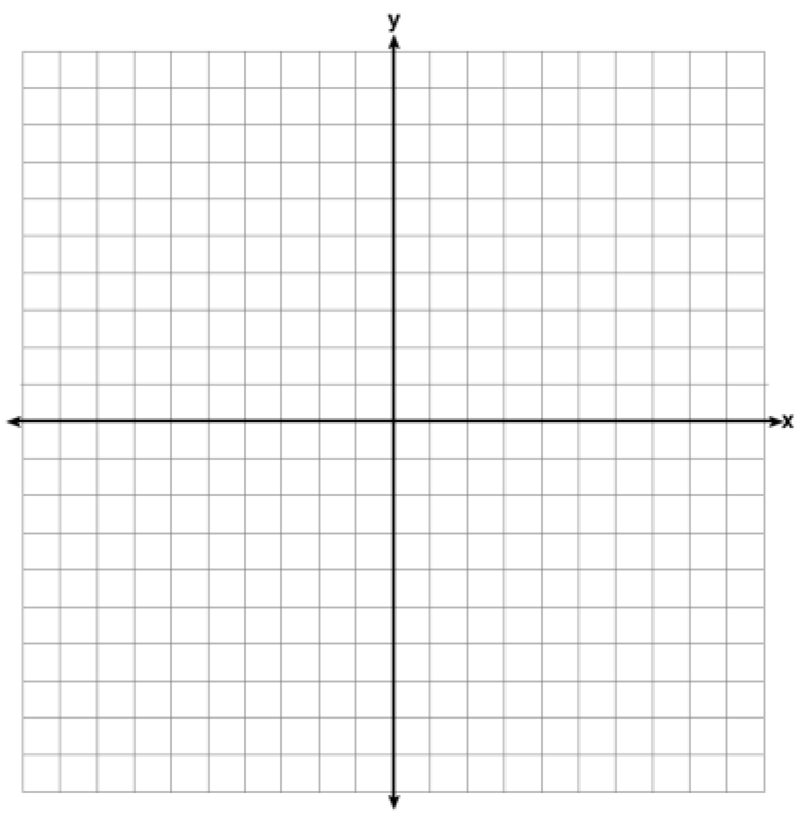
b. Graph the equation on the coordinate grid. **Label everything for full credit!**



Summary:

Name: ____ Date: ____________________

Day 9-10
6-point questions

We do:	Notes
Jonathan makes a weekly allowance of \$25. He also makes \$9.50 an hours at his job. Because of his age, Jonathan can work no more than 20 hours per week. a) Write a function for the amount of money he makes each week based on the amount of hours, *h*, he works. b) What is the domain of the function for this situation? c) Sketch the graph of the function over the domain you chose. 	

You do:

A local business was looking to hire a landscaper to work on their property. They narrowed their choices to two companies. Flourish Landscaping Company charges a flat rate of $120 per hour. Green Thumb Landscapers charges $70 per hour plus a $1600 equipment fee.

Write a system of equations representing how much each company charges.

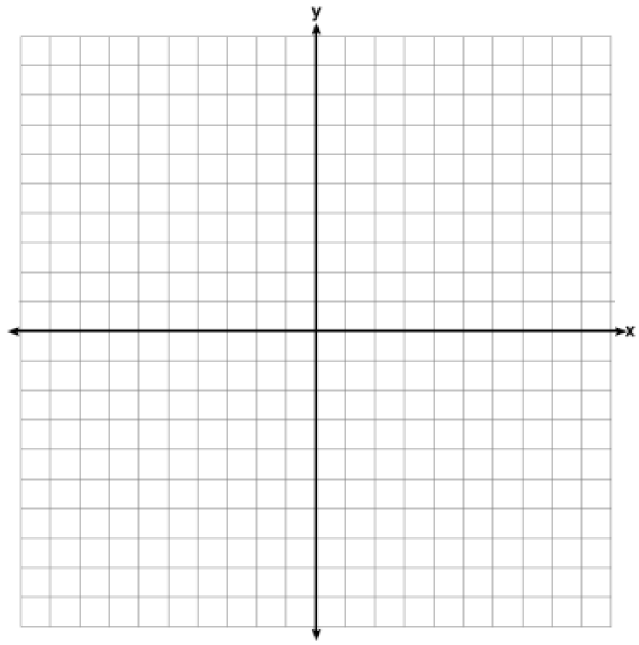
Determine and state the number of hours that must be worked for the cost of each company to be the same. [The use of the grid below is optional.]

If it is estimated to take at least 35 hours to complete the job, which company will be less expensive? Justify your answer.

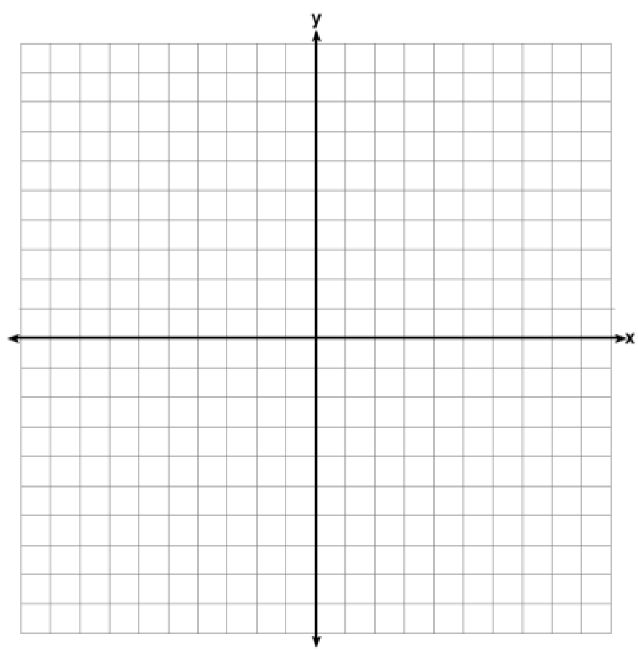
We do:

Graph the following piecewise defined function on the axes provided.

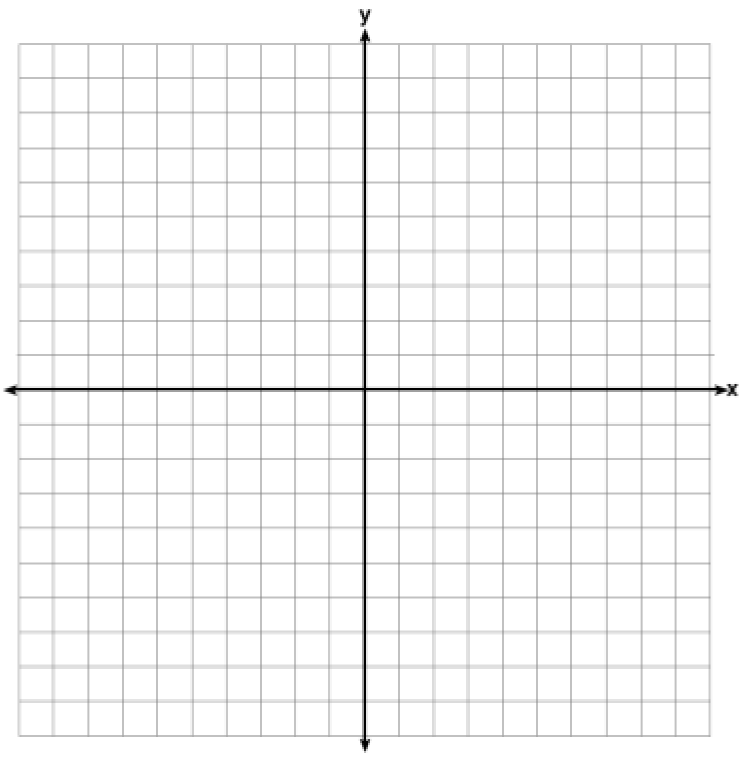
$$f(x) = \begin{cases} x + 2; if x \le 0 \\ x^2 - 2; if x > 0 \end{cases}$$



You do:



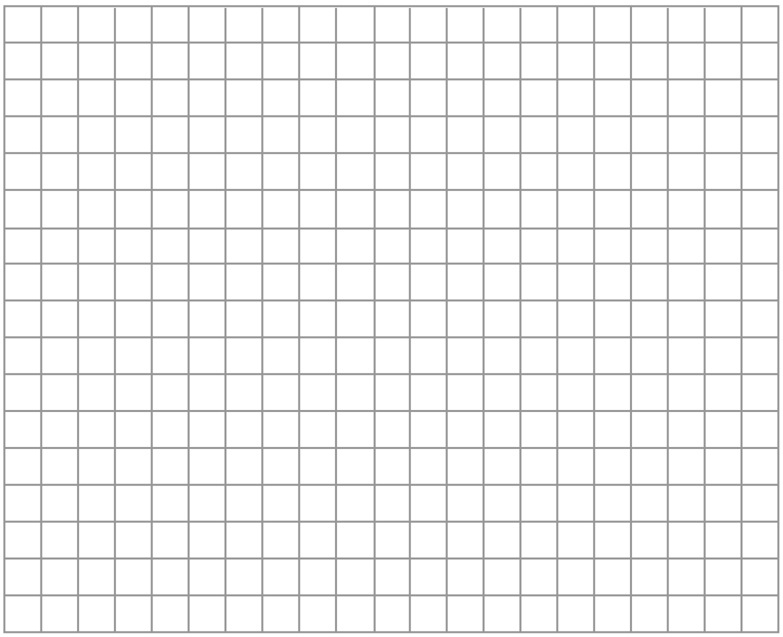
Notes

You do:	Notes
Next weekend Marnie wants to attend either carnival A or carnival B. Carnival A charges \$6 for admission and an additional \$1.50 per ride. Carnival B charges \$2.50 for admission and an additional \$2 per ride. a) In function notation, write $A(x)$ to represent the total cost of attending carnival A and going on x rides. In function notation, write $B(x)$ to represent the total cost of attending carnival B and going on x rides. b) Determine the number of rides Marnie can go on such that the total cost of attending each carnival is the same. [Use of the set of axes below is optional.] c) Marnie wants to go on five rides. Determine which carnival would have the lower total cost. Justify your answer. 	

A water balloon is thrown into the air and the height in feet at each second is recorded in the tabled below.

Time (x)	0	1	2	3	4	5	6	7	8	9	10
Height (y)	0	9	16	21	24	25	24	21	16	9	0

a. Plot the points from the table and complete the graph to show the path of the water balloon as it splashes to the ground. Be sure to label your axes with the proper units.



b. At what time does the balloon hit the ground?

c. What is the maximum height that the balloon reaches?

d. At what time does the balloon reach its maximum height?

e. Circle the type of equation that the above graph represents:

exponential quadratic

Explain how you know.