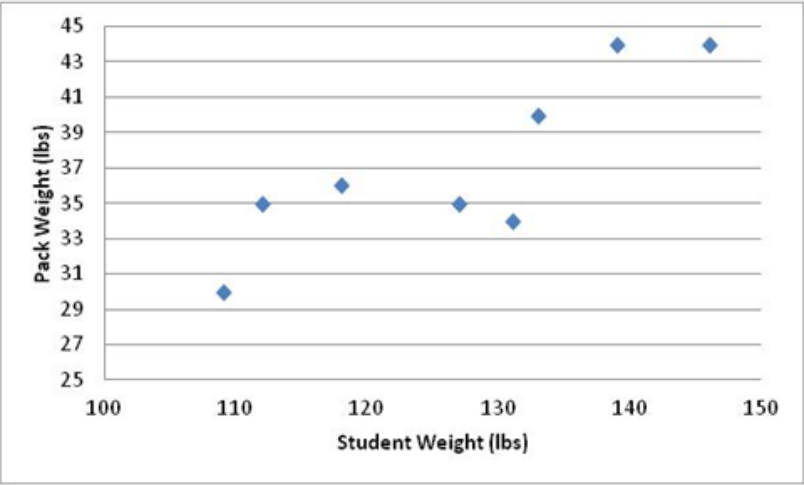


Algebra 1 Semester 2 Final--Version A

Name	Weight (lbs)	Pack Wt. (lbs)
Javier	146	44
Jeremiah	118	36
Xenia	112	35
Rufus	127	35
Paul	131	34
Maria	109	30
Estefanie	133	40
Emilio	139	44

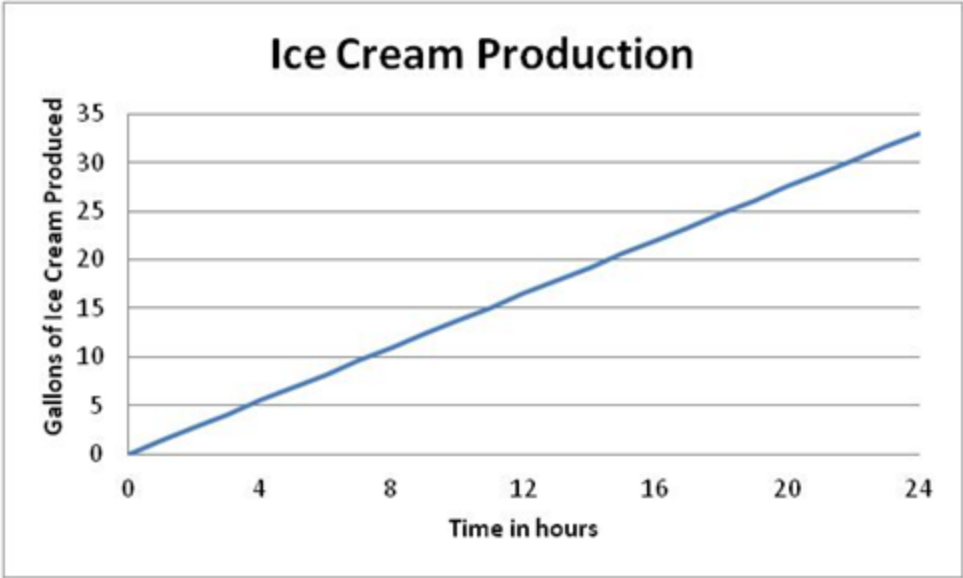


1) Many health professionals are concerned that students are developing back and shoulder problems caused by carrying backpacks that are too heavy. Some doctors have recommended that the weight of a student's backpack should not exceed 10% of the student's body weight. The body and backpack weights of the eight high school students are given above, along with a scatterplot of the data.

What can you say about the relationship between how much a student weighs, and how much their backpack weighs?

- A) Heavier students always carry heavier packs.
- B) Weighing more causes a student to carry a heavier backpack.
- C) There is a strong negative correlation between a student's body weight and the weight of his or her backpack.
- *D) There appears to be a positive correlation between pack weight and body weight.

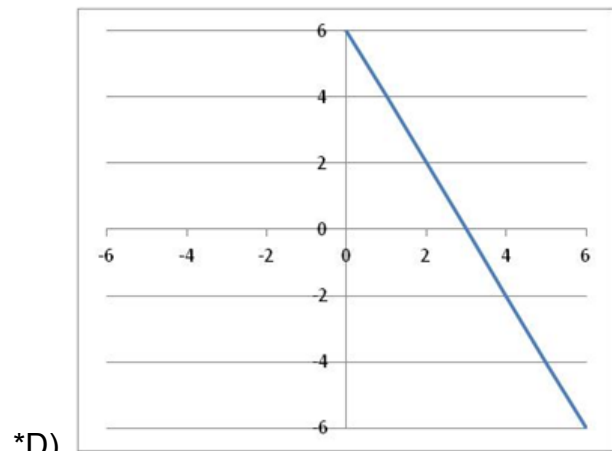
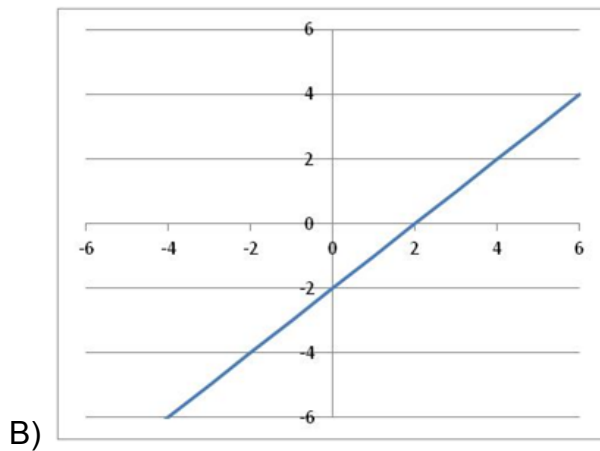
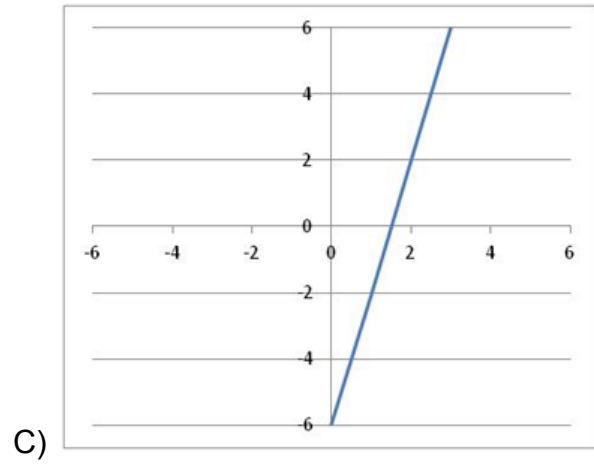
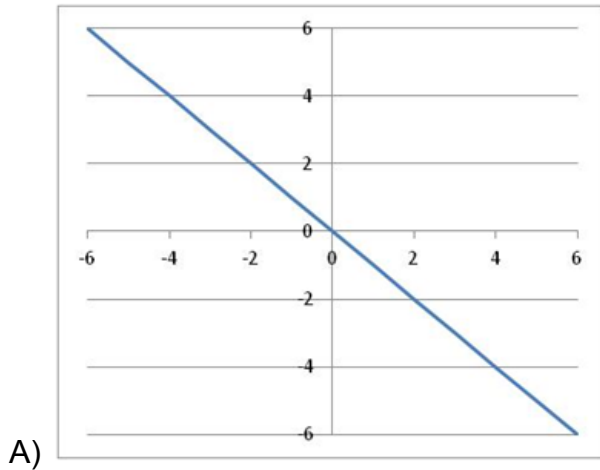
2) An ice cream factory can produce a certain number of gallons of ice cream each day of continuous operation. Its rate of production for ice cream is shown on this graph. If the factory operates continuously for 1000 hours, how much ice cream will it have produced?



- A) 34
- *B) 1,400
- C) 34,000
- D) 24

3) Draw a graph containing the data found in the table below:.

x	-16	-12	-8	-4	0
y	38	30	22	14	6



4) Popcorn vendors at basketball games are paid for each bag they sell. The table to the right shows a list of popcorn vendors and the profit each person made one night. How much profit will a vendor make by selling 96 bags? Solve and show your work.

- A) 66
B) 28
C) 40
* D) 46

Vendor	Number sold	Profit
James	36	10
Ricky	46	16
Claudia	56	22
Frank	66	28

5) The owner of a newspaper stand recorded the below data from one week. According to the data, write an equation that describes the relationship between the number of customers (c) and the amount of sales (s).

Number of customers, c	6	12	18	24	30	36
Amount of sales, s	\$3.00	\$6.00	\$9.00	\$12.00	\$15.00	\$18.00

- A) The sales are twice as much as the number of customers, $c = 2s$
- *B) The sales are half as much as the number of customers, $s = 0.5 c$
- C) The sales are twice as much as the number of customers, $s = 2c$
- D) The sales are half as much as the number of customers, $c = 0.5 s$

6) After gathering the height and shoe size data, Coach Lower decides to look at another measurement association. The below represents the heights and arm spans of students in his Physical Education class. Describe the association between height and arm span, if height is used as the independent variable (e.g. weak or strong, positive or negative association.)

Height (inches)	73	60	69	72	62	61
Arm Span (inches)	70	62	67	73	60	62

- *A) There is a strong, positive association between height and arm span.
- B) There is a weak, positive association between height and arm span.
- C) There is a strong, negative association between height and arm span
- D) The relationship between height and arm span does not appear to be linear.

7) Solve the equation

$$x + 8 = 16$$

- A) -8
- B) 2
- *C) 8
- D) -2

8) Solve the equation

$$\frac{2}{3}x = 16$$

- A) 8
- B) 32
- *C) 24
- D) 48

9) Solve the equation

$$4x - 12 = 20$$

- A) $-1/2$
- *B) 8
- C) 32
- D) 16

10) What is the solution set of the equation

$$4x - (4 - x) = 5x$$

- A) $\{-2\}$
- B) $\{1/2\}$
- C) $\{-1/2\}$
- *D) $\{ \}$

11) Solve the inequality

$$3x - 3 > x + 7$$

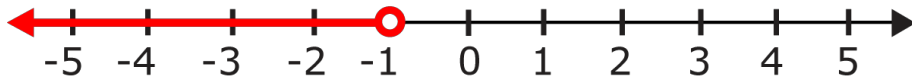
- A) $x < 5$
- B) $x > 2$
- C) $x < 2$
- *D) $x > 5$

12) Solve the inequality

$$2(x - 3) - 6 < 4(x - 7)$$

- *A) $x > 8$
- B) $x < 8$
- C) $x > -8$
- D) $x < -8$

13) Which inequality is graphed on this number line?



- A. $x > -1$
- B. $x \geq -1$
- C. $x < -1$
- D. $x \leq -1$

14) Your employer tells you that the salary for your new job will be at least \$298 per week but not more than \$615 per week. Write an inequality that shows this.

- A) $298 < x < 615$
 B) $298 < x \leq 615$
 C) $298 < x < 615$
 *D) $298 \leq x \leq 615$

15) What is the solution to

$$2x + 3x + 5 \leq -20$$

- A) $x \leq -15$
 *B) $x \leq -5$
 C) $x < 5$
 D) $x \leq 5$

16) Bobby solved the equation $x + 3 = 3(x + 5)$ by making a t-chart. He put $x + 3$ on the left, and $3(x+5)$ on the right. Then, he started guessing different values for x , and keeping track of what $x+3$ and $3(x+5)$ were equal to each time by using the t-chart. He *did not stop* guessing when he found the correct solution for x . Which table below shows the best solution, and why?

x	x+3	3(x+5)
-5	-2	0
-4	-1	3
-3	0	6
-2	1	9

x	x+3	3(x+5)
-7	-4	-6
-6	-3	-3
-5	-2	0
-4	-1	3

A) The solution is -3, because $x + 3$ is 0 there.

*C) The solution is -6, because $x+3$ and $3(x+5)$ are the same there.

x	x+3	3(x+5)
-7	-4	-6
-6	-3	-3
-5	-2	0
-4	-1	3

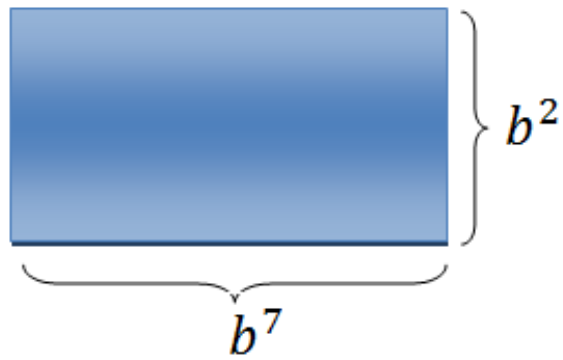
B) The solution is -3, because $x+3$ and $3(x+5)$ are the same there

x	x+3	3(x+5)
-10	-7	-15
-8	-5	-9
-4	-1	3
-2	1	9

D) The solution is -4, because $x+3$ is -1 and $3(x+5)$ is 3 there

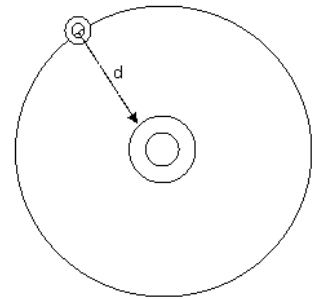
17) Find the area of the rectangle.

- A) b^5
- *B) b^9
- C) b^{18}
- D) b^7



18) The planet Mercury is about $d = 3.5 \times 10^7$ miles from the sun. The speed of light, c , is about 1.75×10^5 miles per second. Use the formula $t = d / c$ to find out how many seconds, s , it takes for sunlight to travel from the sun to Mercury.

- A) 2×10^9
- B) 5×10^2
- C) 2×10^{-2}
- *D) 2×10^2



19) What is the value of y in the following expression if x is -3 ?

$$y = \frac{x^6}{x^3}$$

- A) $y = 27$
- *B) $y = -27$
- C) $y = -9$
- D) $y = -8$

20) Which expression represents the product?

$$(-3x^3)^3(3x^5)$$

*A) $-81x^{14}$

B) $-27x^{14}$

C) $27x^8$

D) $-81x^8$

21) The mass of the supermassive black hole at the center of our galaxy is 2,600,000 times that of our own sun. What is this number in scientific notation?

*A) 2.6×10^6

B) 26×10^5

C) 2.6×10^5

D) 26×10^6

22) How would the graph be affected if the equation changed from

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

to

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

A) The graph would intercept the y-axis at -4 instead of +4.

B) The graph would become wider.

*C) The graph would reflect across the x-axis.

D) The graph would reflect across the y-axis.

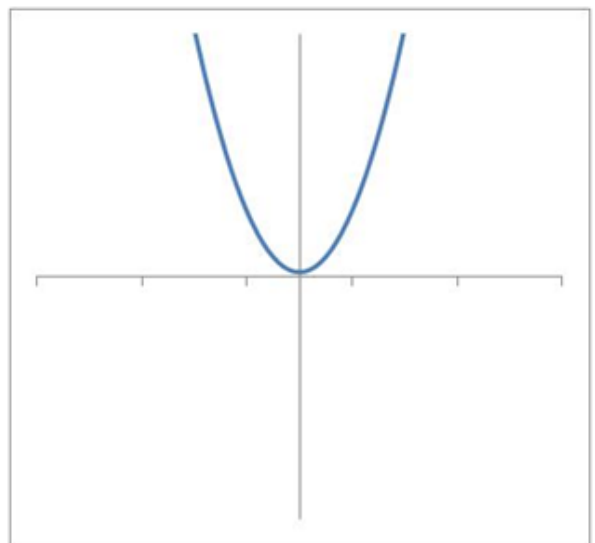
23) Which equation best represents the graph to the right?

*A) $\frac{1}{2}x^2 + 1$

B) $-x^2 - 1$

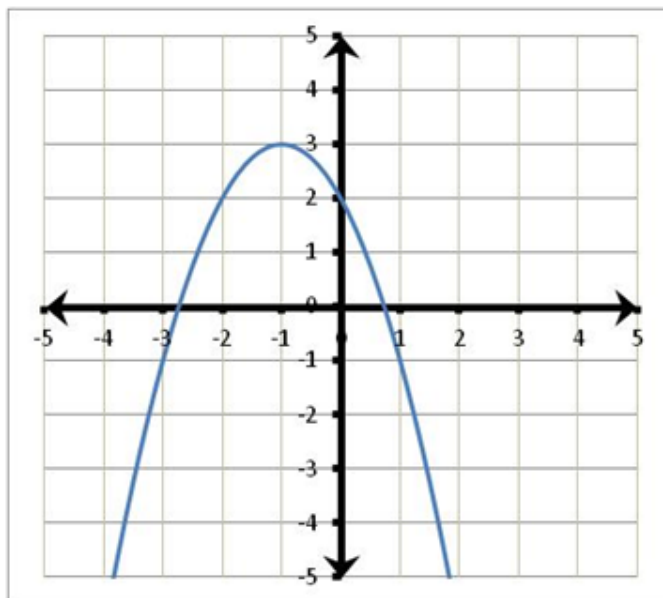
C) $-5x^2 - 1$

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



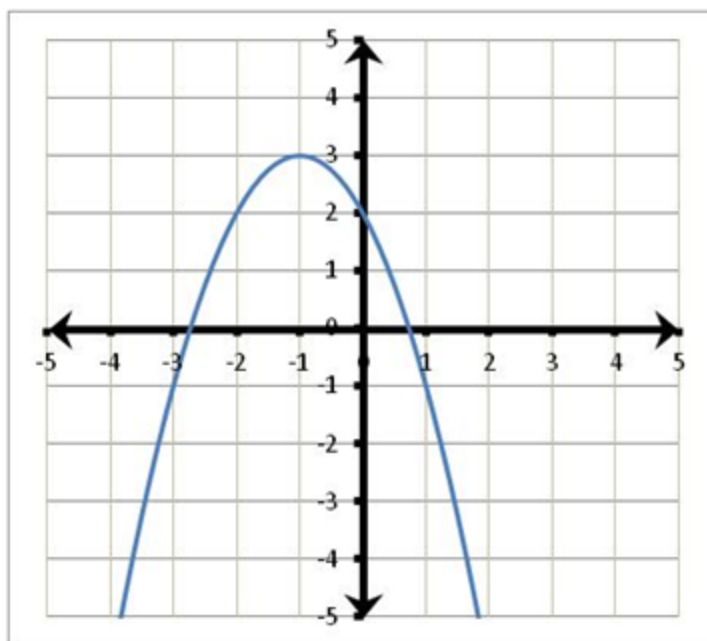
24) What is the vertex of the graph to the right?

- A) (0,2)
- *B) (-1,3)
- C) (2,0)
- D) (3,-1)



25) What is the y-intercept of the graph to the right?

- *A) (0,2)
- B) (-1,3)
- C) (2,0)
- D) (3,-1)



26) Which function includes all of the coordinate points in the table below?

x	-3	-1	0	2	4
y	-10	-2	-1	-5	-17

- A) $y = x^2 + 1$
- B) $y = x^2 - 7$
- C) $y = x^2 + 1$
- *D) $y = -x^2 - 1$

27) What is the general form of a quadratic function?

A) $y = 1x^2 + 1x + 1$

B) $y = mx + b$

*C) $y = ax^2 + bx + c$

D) $y = x^2$

28) What is the technical term for the shape a quadratic creates?

A) u-shape

B) hyperbola

C) curve

*D) parabola

29) A portion of the quadratic equation

$y = 2(x+2)^2 + 1$

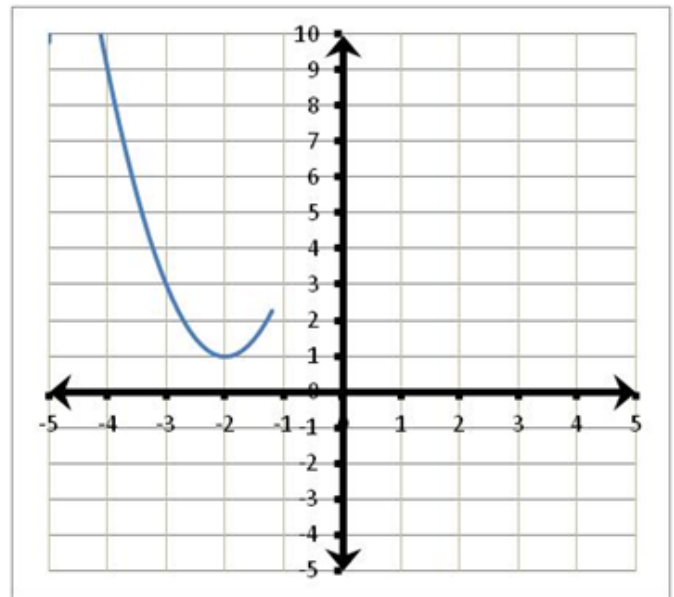
is shown above. One value where y is equal to 3 is $x = -3$. For which other value of x does y equal 3?

A) $x = 2$

*B) $x = -1$

C) $x = 53$

D) $x = -2$



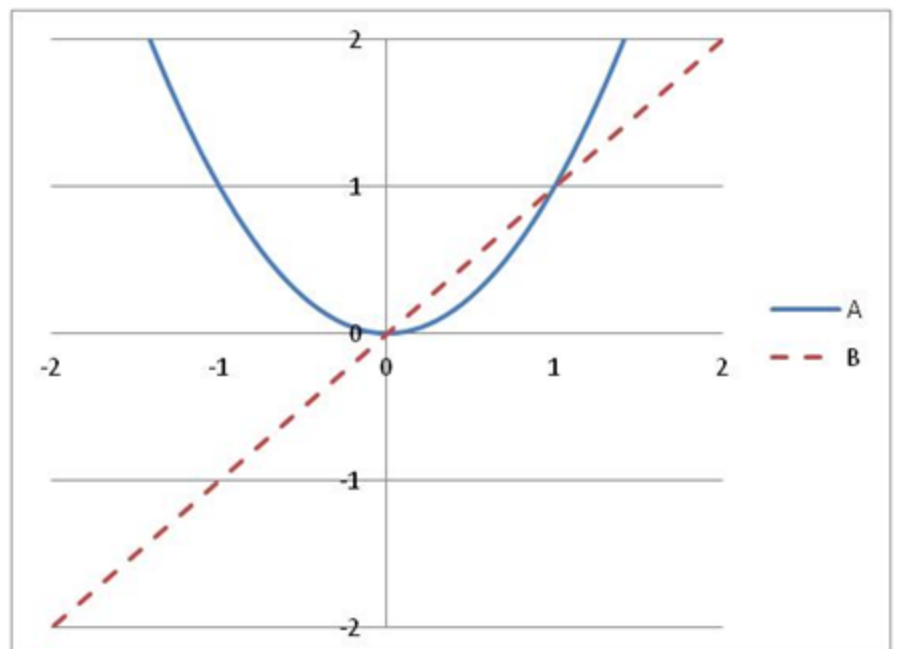
30) The diagram to the right displays two graphs: $y = x^2$ and $y = x$. Please match the labels with the correct equation **AND** determine the two points of intersection.

A) Label A is $y = x^2$ and Label B is $y = x$; (1,0) & (0,-1)

B) Label A is $y = x$ and Label B is $y = x^2$; (0,1) & (0,0)

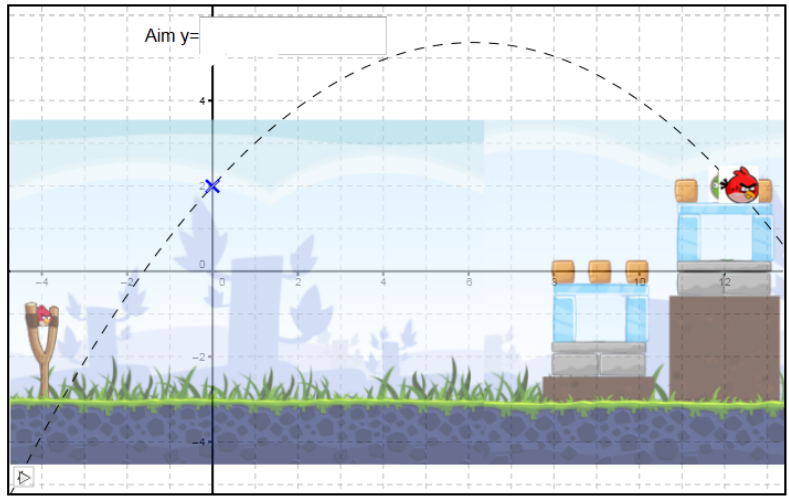
C) Label A is $y = x^2$ and Label B is $y = x$; (1,-1) & (1,0)

*D) Label A is $y = x^2$ and Label B is $y = x$; (1,1) & (0,0)



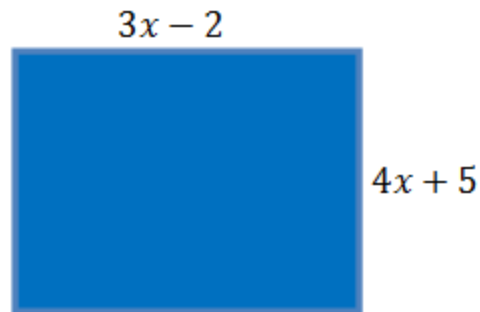
31) Which quadratic equation below would best be used for the Angry Birds scenario to the right?

- A) $y = .25x^2 + .5x + 13$
- *B) $y = -.09x^2 + 1x + 2$
- C) $y = 2x^2 + .5x - 1$
- D) $y = -.34x^2 + .5x - 3$



32) Which expression represents the area of the rectangle shown?

- A) $7x^2 - 10$
- B) $12x + 10$
- *C) $12x^2 + 7x - 10$
- D) $19x - 10$



33) What is the product of $(6x - 3)(-x + 4)$?

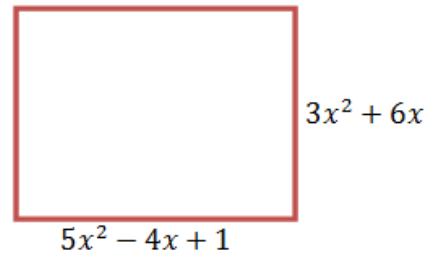
- A) $5x^2$
- B) $-6x + 12$
- C) $6x^2 - 3x - 12$
- *D) $-6x^2 + 27x - 12$

34) Simplify: $4x(x + 3) + (2x + 5)(x - 3)$

- A) $6x - 3$
- *B) $6x^2 + 11x - 15$
- C) x
- D) $19x - 2$

35) Find the perimeter of a rectangle with a length of $3x^2 + 6x - 2$ and a width of $5x^2 - 4x + 1$.

- *A) $16x^2 + 4x - 2$
- B) $8x^2 + 2x - 1$
- C) $15x^4 - 24x^2 - 2$
- D) $11x^2 + 8x - 3$



36) Simplify $(-4x^4 + 3x^3 - 7x^2 - x) + (-9x^3 + 7x^2 - 5x - 1)$.

- *A) $-4x^4 - 6x^3 - 6x - 1$
- B) $-4x^4 + 12x^3 + 4x + 1$
- C) $4x^4 + 6x^3 + x^2 - 5x - 1$
- D) $-13x^4 + 10x^3 - 12x^2 + 1x$

37) Which binomials are factors of $(x^2 + 7x + 12) = 0$?

- A) $(x + 7)(x + 12)$
- *B) $(x + 4)(x + 3)$
- C) $(x - 4)(x - 3)$
- D) $(x - 7)(x - 12)$

38) Jenny has calculated the area of her house as the equation $10x^2 - 5x + 2$. She knows that the area of her bedroom can be calculated using the equation $2x^2 + 4x + 4$. What is the total area of the rest of Jenny's house?

- A) $8x^2 - 1x + 6$
- B) $12x^2 - 1x + 6$
- *C) $8x^2 - 9x - 2$
- D) $12x^2 + 9x - 2$

39.) What are the factors of $(x^2 - 9) = 0$?

- *A) $x = 3$ and $x = -3$
- B) $x = 9$ and $x = -9$
- C) $x = 4.5$ and $x = -4.5$
- D) $x = 0$

40.) Simplify: $\frac{(x-1)(x+5)}{(x+5)(x-5)}$

- A) $\frac{(x-1)}{(x+5)}$
- B) $\frac{(x+5)}{(x-5)}$
- *C) $\frac{(x-1)}{(x-5)}$
- D) $(x + 5)$

41.) Simplify: $6x(3x^3 + 5x^2 - 10x + 4)$

A) $18x^3 + 30x^2 - 60x + 24$

B) $18x^4 + 5x^2 - 10x + 4$

*C) $18x^4 + 30x^3 - 60x^2 + 24x$

D) $18x^3 + 5x^2 - 10x + 4$

Vocabulary Matching

1. Graphical representation	a. The set of all points in a plane that are equidistant from a line, called the directrix, and a point not on the line, called the focus. It is the U-shape characteristic of polynomials of degree 2.
2. Exponent	b. The a numbers or expressions that can be multiplied by another number or expression to get N. For example, 3 and 4 are the _____ of 12 because 3 times 4 is 12.
3. Parabola	c. A number or a variable in an expression that represents how many times another number or variable in the expression is used as a factor in repeated multiplication. For example, in the expression 2 to the 5th power, the 5 is this and indicates that the 2 will be used as a factor 5 times: 22222
4. Correlation	d. Describes the strength of a relationship between two variables. It is a measure of how likely it is for one thing to happen, given than some other thing has happened
5. Factor	e. A way of representing the relationship between two variables which draws their coordinates on a plane.

Vocabulary Multiple Choice

6. When working with exponents, this is the number or expression that is used for repeated multiplication, as indicated by the exponent. In 2 to the fourth power, this is 2.
- Base
 - Factor
 - Degree
 - Parabola
7. A line that divides a region into 2 parts in such a way that one half is a reflection or mirror image of the other part.
- Polynomial
 - Line of Symmetry
 - Coefficient
 - Base

8. When a number is added to its this, the sum is always zero. For example, +4 and -4 are this because their sum is zero.
 - a. Degree
 - b. Multiplicative Inverse
 - c. Coefficient
 - d. Additive Inverse
9. The point at which a parabola crosses its axis of symmetry; the bottom or top of a parabola.
 - a. Line of Symmetry
 - b. Correlation
 - c. Parabola
 - d. Vertex of a parabola
10. A way of representing the relationship between two variables which abbreviates them as letters, in an equation or rule.
 - a. Graphical representation
 - b. Correlation
 - c. Numerical representation
 - d. Symbolic representation

Vocabulary TRUE OR FALSE:

11. Numerical representation → A way of representing the relationship between two variables which draws their coordinates on a plane.

A. True
B. False
12. Multiplicative Inverse → When a number is added to its this, the sum is always zero. For example, +4 and -4 are this because their sum is zero.

A. True
B. False
13. Polynomial → A sum of terms that are numbers, variables, or products of numbers and variables with nonnegative integral exponents.

A. True
B. False
14. Degree → The greatest exponent in a polynomial

A. True
B. False
15. Coefficient → A number or a variable in an expression that represents how many times another number or variable in the expression is used as a factor in repeated multiplication. For example, in the expression 2 to the 5th power, the 5 is this and indicates that the 2 will be used as a factor 5 times: **22222**.

A. True
B. False

Number of Roses	Roses-R-Red	Flower Power
0		\$10.00
1		\$10.50
3		\$11.50
4		\$12.00
7		\$13.50
10		\$15.00
13		\$16.50



Above is information for two different flower companies. On the left is a data table which shows the cost of Roses at 'Flower Power', for different numbers of roses. On the right is a graph, and it shows the cost of Roses at 'Roses-R-Red'.

How much does one flower cost at Roses-R-Red? Where did you look to find this?
 How much does Flower Power start out costing? Where did you look to find this?

In this problem, you need to find out when the two companies cost the same amount. There are many different strategies for doing this.

- 1) Use whatever strategy you would like to answer: How many roses would you need to buy for the two companies to cost the same amount? Include any drawings, computations, graphs, or tables you used in coming to your conclusions.

In a moment, you are going to write a paragraph to argue that the strategy is the best one for solving this problem. First, however, you need to plan it out. Start by listing at least five vocabulary words from the class you plan on using. Your plan should have a topic sentence (What was the solution, and why was my strategy the best?), three support sentences (What vocabulary or ideas from the class does this strategy apply? Where does it fit into all the things I learned this year? What do I remember from the time I was learning it?), and an explanation or concluding sentence.

- 2) Write a paragraph, explaining how you answered the question, "How many roses would you need to buy for Flower Power to cost the same amount as Roses-R-Red?"
- 3) There are *many* strategies for figuring out how many roses would cost the same amount from the two companies. Solve the problem again, but this time you *must* use the fact that the slope of Roses-R-Red is \$1.00, and the intercept of Flower Power is \$10.00, as part of your solution.

Help for planning your paragraph

Topic Sentence

- Describe the problem and its solution

Support Your Point-You *must* use three vocabulary terms from the class. Your support may include:

- when did you learn this strategy
- why do you prefer this strategy over other strategies
- personal experiences and/or
- logical arguments/facts

Explain Your Support- Explain & elaborate why you picked this particular strategy for solving the problem

- Another way to say this is...
- What I mean by this is...
- This shows that...
- The reason for this is that...
- This is important because...
- In other words...
- For example,