

Algebra 1 Semester 2 Final--Version C

1) Your employer tells you that the salary for your new job will be more than \$298, and at least \$615 per week. Write an inequality that shows this.

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

2) What is the solution to

$$7x - x + 6 > -12$$

- *A) $x > -3$
B) $x < -3$
C) $x > 1$
D) $x < 1$

3) Bobby solved the equation $x - 6 = -2(x + 5)$ by making a t-chart. He put $x - 6$ on the left, and $-2(x + 5)$ on the right. Then, he started guessing different values for x , and keeping track of what $x - 6$ and $-2(x + 5)$ 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-6	-2(x+5)
-3	-10	-4
-2	-9	-6
-1	-8	-8
0	-7	-10

x	x-6	-2(x+5)
-7	-14	4
-6	-13	2
-5	-12	0
-4	-11	-2

- A) The solution is -8, because $x-6$ and $-2(x+5)$ are the same there.
C) The solution is -5, because $-2(x + 5)$ is zero there.

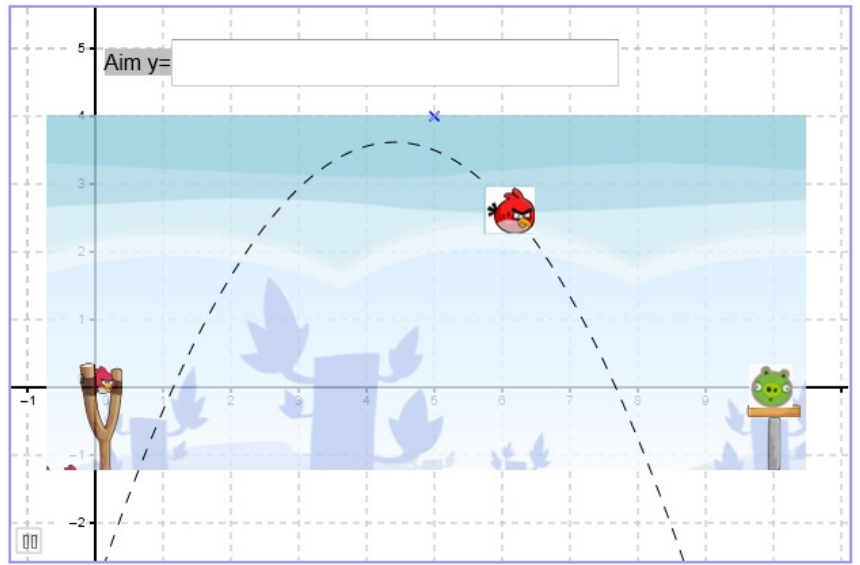
x	x-6	-2(x+5)
-3	-10	-4
-2	-9	-6
-1	-8	-8
0	-7	-10

x	x-6	-2(x+5)
-7	-14	4
-6	-13	2
-5	-12	0
-4	-11	-2

- *B) The solution is -1, because $x-6$ and $-2(x+5)$ are the same there
D) The solution is -6, because $x - 6$ is -13 there.

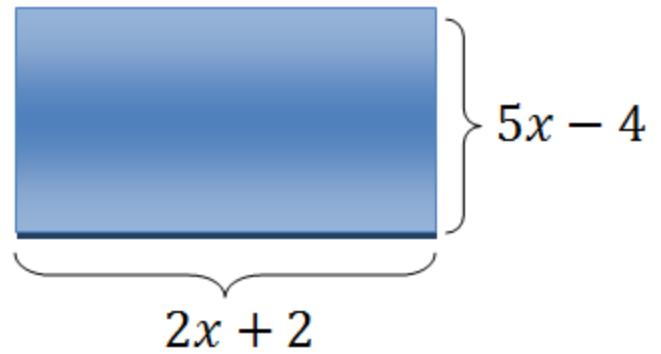
4) Which quadratic equation below would best be used for the Angry Birds scenario to the right?

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



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

- A) $7x^2 - 8$
- B) $10x - 2$
- *C) $10x^2 + 2x - 8$
- D) $19x - 10$



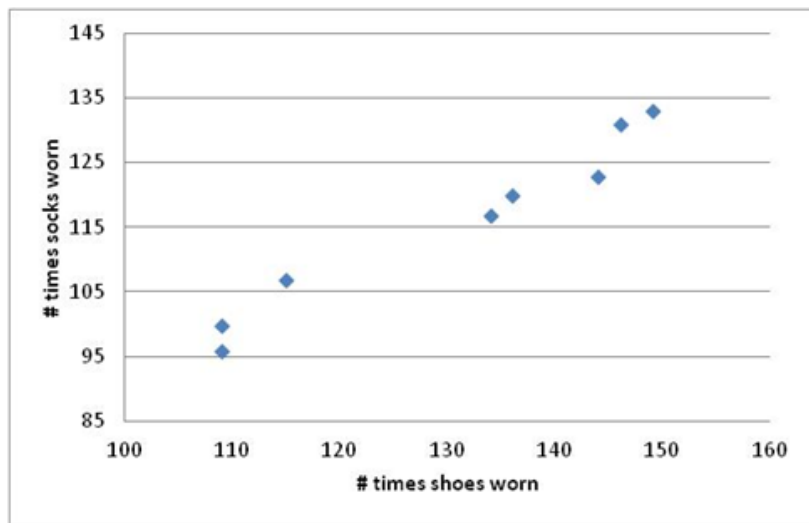
6) What is the product of $(6x + 3)(-x + 4)$?

- A) $5x^2$
- B) $-6x + 12$
- *C) $-6x^2 + 21x + 12$
- D) $-6x^2 + 27x - 12$

7) Simplify: $3x(x + 2) + (5x + 9)(x - 1)$

- A) $8x - 3$
- *B) $8x^2 + 10x - 9$
- C) x
- D) $19x - 2$

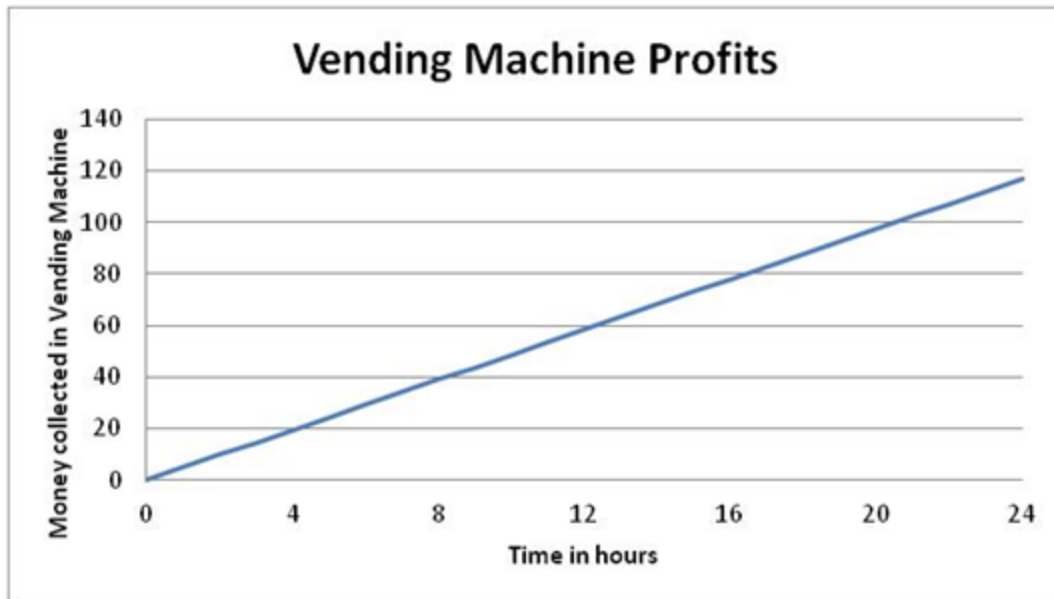
Name	# times shoes worn	# times socks worn
Javier	109	100
Jeremiah	144	123
Xenia	109	96
Rufus	115	107
Paul	134	117
Maria	149	133
Estefanie	146	131
Emilio	136	120



8) Mr. Schubel's class performed an experiment in which students counted how many days they wore shoes, and how many days they wore socks. The data collected for eight students is on the left, and a scatter plot of these data is on the right.

- A) Every time students wore socks, they wore shoes.
- B) Wearing socks causes you to wear shoes.
- C) There is a strong negative correlation between the number of times you wear socks and the number of times you wear shoes.
- *D) There appears to be a positive correlation between wearing socks and wearing shoes.

9) The people who own the vending machines in the middle of campus keep a record of how quickly they earn money. Graphed below is how much money they earn over the course of a day. If they continue making money at a constant rate, how much money will be in the vending machine after 500 hours?



- *A) \$2,500
- B) \$140
- C) \$1,400
- D) \$117

10) 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	18	24	30	36	42	48
Amount of sales, s	\$54.00	\$72.00	\$90.00	\$108.00	\$126.00	\$144.00

- A) The sales are three times as much as the number of customers, $c = 3s$
- B) The sales are half as much as the number of customers, $s = 0.5 c$
- *C) The sales are three times as much as the number of customers, $s = 3c$
- D) The sales are half as much as the number of customers, $c = 0.5 s$

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

Shoe Size	9	8	10	8	12	11
Height (inches)	45	40	51	42	62	59

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

12) Solve the equation

$$x + 6 = 17$$

- A) 17
- B) -6
- C) 23
- *D) 11

13) Solve the equation

$$\frac{2}{5}x = 6$$

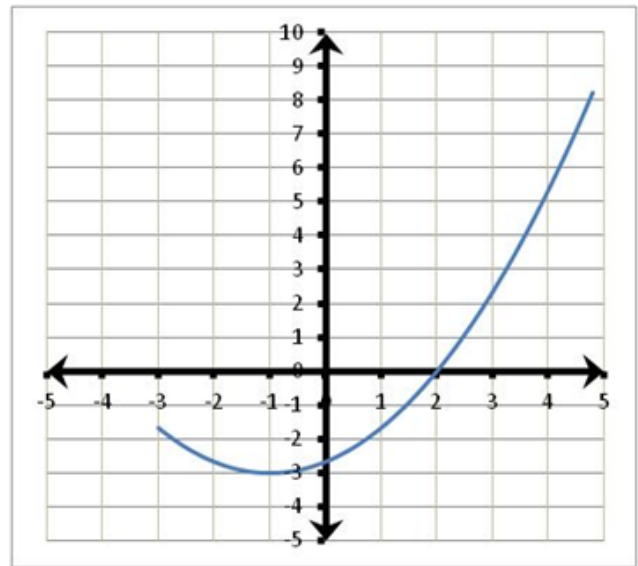
- *A) 15
- B) 30
- C) 11
- D) 8

14) A portion of the quadratic equation

$$y = (x+1)^2/3 - 3$$

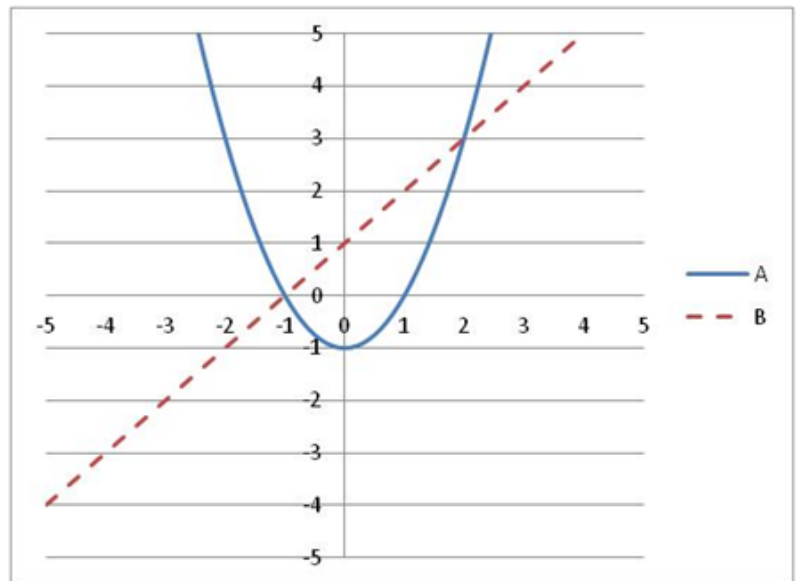
is shown above. One value where y is equal to 0 is $x = 2$. For which other value of x does y equal 0?

- A) $x = 2$
- B) $x = 4$
- C) $x = 53$
- *D) $x = -4$



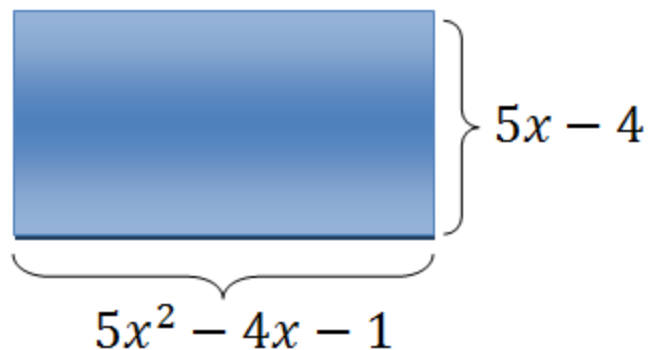
15) The diagram to the right displays two graphs: $y = x^2$ and $y = x$. Please match the labels with the correct equation **AND** determine the two points of intersection.

- *A) Label A is $y = x^2 - 1$ and Label B is $y = x$; $(-1,0)$ & $(2,3)$
- B) Label A is $y = x$ and Label B is $y = x^2$; $(0,1)$ & $(0,0)$
- C) Label A is $y = x^2 - 1$ and Label B is $y = x$; $(2,3)$ & $(1,0)$
- D) Label A is $y = x^2 - 1$ and Label B is $y = x$; $(1,1)$ & $(0,0)$



16) Find the perimeter of a rectangle with a length of $5x - 4$ 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) $10x^2 + 2x - 10$



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

A) $-4x^4 - 6x^3 - 6x - 1$

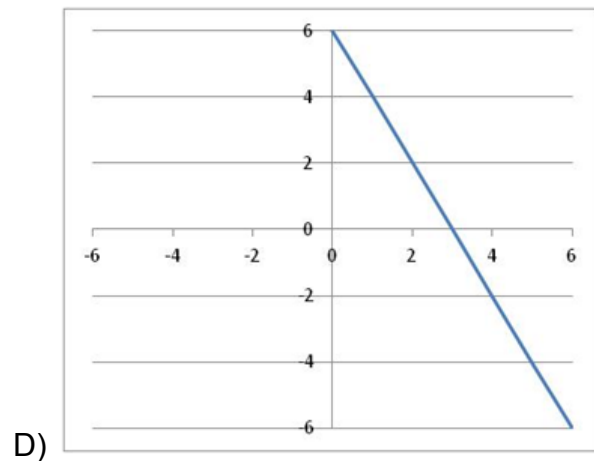
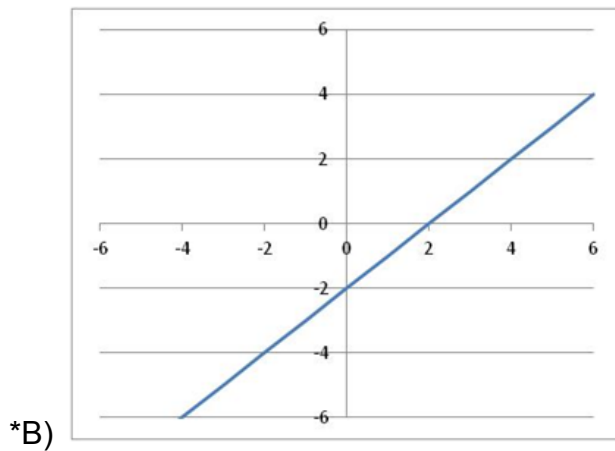
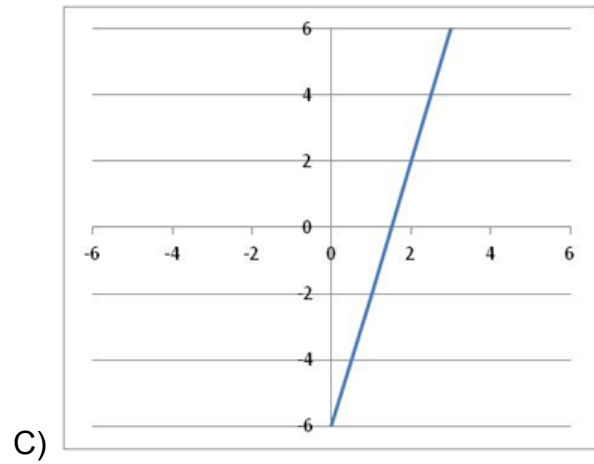
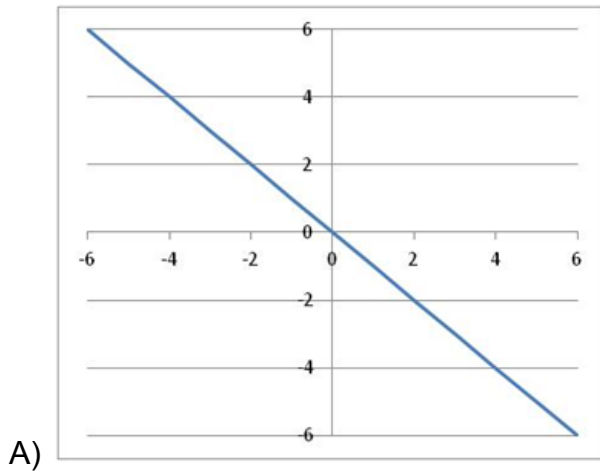
*B) $-4x^4 + 12x^3 + 4x + 1$

C) $4x^4 + 6x^3 + x^2 - 5x - 1$

D) $-13x^4 + 10x^3 - 12x^2 + 1x$

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

x	-12	-8	-4	0	4
y	-14	-10	-6	-2	2



19) 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 76 bags? Solve and show your work.

- A) 33
- *B) 48
- C) 38
- D) 43

Vendor	Number sold	Profit
James	16	18
Ricky	26	23
Claudia	36	28
Frank	46	33

20) Which binomials are factors of $(x^2 + 8x + 16) = 0$?

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

21) Jenny has calculated the area of her house as the equation $14x^2 + 3x + 10$. 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) $12x^2 + 9x - 2$

22) What are the solutions of $(x^2 - 81) = 0$?

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

23) 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) $(x + 5)$

24) Simplify: $7x(7x^3 + 8x^2 - 4x + 3)$

A) $49x^3 + 56x^2 - 28x + 21$

B) $49x^4 + 8x^2 - 4x + 3$

*C) $49x^4 + 56x^3 - 28x^2 + 21x$

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

25) Solve the equation

$$3x - 9 = 9$$

A) -6

B) No solution

C) 0

*D) 6

26) What is the solution set of the equation

$$5x - (7 - x) = 6x$$

A) $\{-2\}$

B) $\{1/2\}$

C) $\{-1/2\}$

*D) $\{ \}$

27) Solve the inequality

$$6x - 12 > x + 3$$

A) $x < 5$

*B) $x > 3$

C) $x < 3$

D) $x > 5$

28) Solve the inequality

$$-7(x - 2) - 6 < -2(x + 6)$$

*A) $x > 4$

B) $x < 4$

C) $x > -4$

D) $x < -4$

29) Which inequality is graphed on this number line?



- *A) $x > -3$
- B) $x \geq -3$
- C) $x < -3$
- D) $x \leq -3$

30) Which expression represents the product?

$$|(-3x^2)^2(3x^4)|$$

- A) $-81x^{14}$
- B) $-27x^{14}$
- *C) $27x^8$
- D) $-81x^8$

31) A hydrogen atom is one angstrom, or 0.0000000001 meters wide. What is this number in scientific notation?

- *A) 1.0×10^{-10}
- B) 10×10^{-9}
- C) 1.0×10^{-9}
- D) 1.0×10^{10}

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

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

to

$$y = \frac{x^2}{4} + 8 \quad ?$$

- 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.

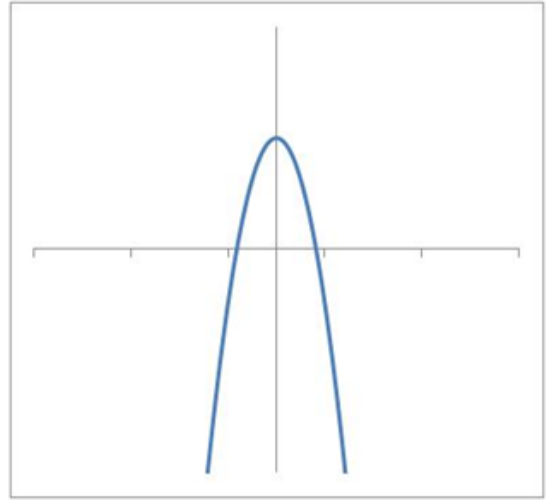
33) Which equation best represents the graph to the right?

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

B) $-x^2 - 1$

C) $-5x^2 - 1$

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



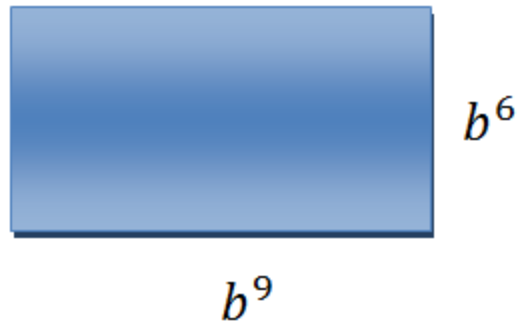
34) Find the area of the rectangle.

A) b^5

B) b^9

C) b^{18}

*D) b^{15}



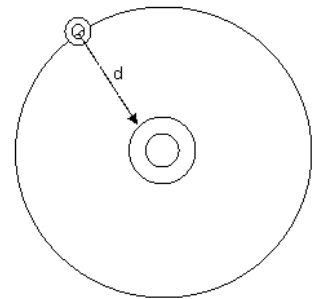
35) The planet Mercury is about $d = 3.5 \times 10^7$ miles from the sun. The speed of light, c , is about 1.75×10^5 miles per second. Use the formula $t = d / c$ to find out how many seconds, s , it takes for sunlight to travel from the sun to Mercury.

A) 2×10^9

B) 5×10^2

C) 2×10^{-2}

*D) 2×10^2



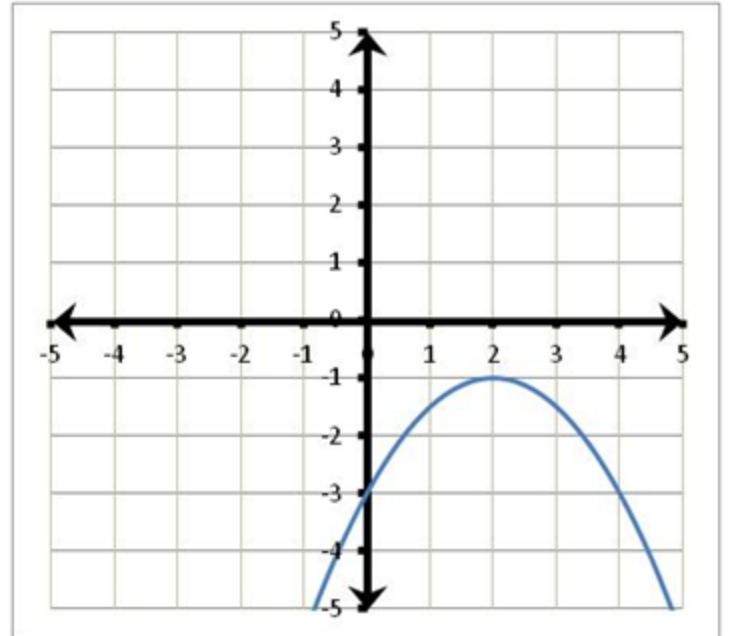
36) What is the value of y in the following expression if x is -3?

$$y = \frac{x^8}{x^6}$$

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

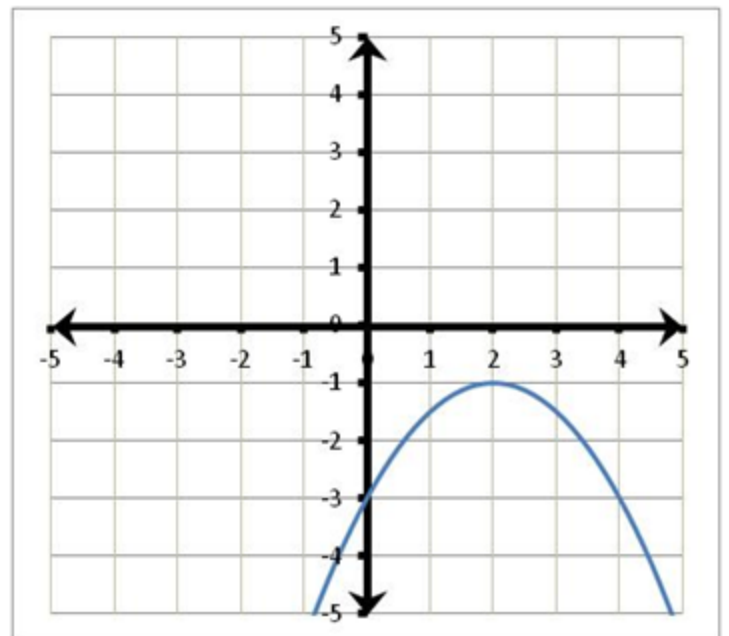
37) What is the vertex of the graph to the right?

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



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

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



39) 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) $y = -x^2 - 1$

40) 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) $y = x^2$

41) What is the technical term for any function of degree 2?

- A) u-shape
- B) hyperbola
- C) curve
- *D) quadratic

Vocabulary Matching

42. Polynomial	A. Describes the strength of a relationship between two variables. It is a measure of how likely it is for one thing to happen, given that some other thing has happened
43. Base	B. 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.
44. Correlation	C. The point at which a parabola crosses its axis of symmetry; the bottom or top of a parabola.
45. Parabola	D. 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.
46. Vertex of a parabola	E. A sum of terms that are numbers, variables, or products of numbers and variables with nonnegative integral exponents.

47. A number that multiplies a variable. For example, in the expression $7x$, it is 7.

- a. Exponent
- b. Degree
- c. Correlation

- d. Coefficient
48. It is the number that, when multiplied by n , gives a product of 1. For example, 7 and $\frac{1}{7}$ th are this, because when you multiply them together they are equal to 1.
- a. Correlation
 - b. Multiplicative Inverse
 - c. Coefficient
 - d. Additive Inverse
49. 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. Additive Inverse
 - d. Coefficient
50. 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.
- a. Factor
 - b. Coefficient
 - c. Line of Symmetry
 - d. Polynomial
51. A way of representing the relationship between two variables which uses a table or t-chart.
- a. Numerical representation
 - b. Correlation
 - c. Symbolic representation
 - d. Graphical representation
52. Degree → 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.
- A. True B. False
53. Exponent → A number that multiplies a variable. For example, in the expression $7x$, it is 7.
- A. True B. False
54. Symbolic representation → A way of representing the relationship between two variables which uses a table or t-chart.
- A. True B. False
55. Factor → They are 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.
- A. True B. False
56. Graphical representation → A way of representing the relationship between two variables which draws their coordinates on a plane.
- A. True B. False

Number of Roses	Roses-R-Red	Flower Power
0		\$14.00
1		\$16.00
3		\$20.00
4		\$22.00
6		\$26.00
10		\$34.00
13		\$40.00



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 your 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 \$4.00, and the intercept of Flower Power is \$14.00, 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,

