



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Find the difference.  $(2g^2 + 3g - 8) - (5g + 1)$

2. Find the product of  $(x+1)(x^2 - 3x + 7)$ .

3. Which polynomial represents the following?  
 $5y(y^4 + 6y^2 - 11)$

- A.  $5y^5 + 30y^3 - 11$
- B.  $5y^4 + 30y^2 - 55y$
- C.  $5y^5 + 30y^3 - 55y$
- D.  $y^4 + 6y^2 + 5y - 11$

4. What is the perimeter of a triangle whose side lengths are  $x^2 + 4$ ,  $2x - 1$ , and  $5x$ ?

- A.  $8x^2 + 3$
- B.  $x^2 + 7x + 3$
- C.  $x^2 + 11x - 1$
- D.  $10x^4 - 5x^3 + 40x^2 - 20x$

5. Below is Tania's work for subtracting two polynomials, but she made a mistake. Identify the step where Tania made her error and write out the remainder of the problem correctly.

$$(x^3 + 8x - 17) - (4x^2 - 11x + 6)$$

Step 1:  $x^3 + 8x - 17 - 14x^2 + 11x - 6$

Step 2:  $x^3 + 14x^2 + 8x - 11x - 17 - 6$

Step 3:  $x^3 + 14x^2 - 3x - 23$



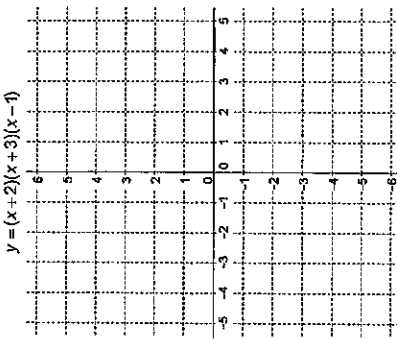
Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Select all of the following that are zeros of the function  $f(x) = x(x + 3)(x - 4)$ .
- A. -6
  - B. -4
  - C. -3
  - D. 0
  - E. 2
  - F. 3
  - G. 4

2. Circle all of the zeros of the function:  $f(x) = (x + 1)(x - 1)(x - 2)(x + 3)$ .

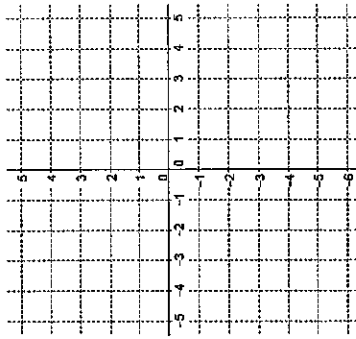
-3	-2	-1	0	1	2	3
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3. Identify the zeros of the polynomial given below. Plot those points on the coordinate plane below and use them to sketch a rough graph of the polynomial.





4. Sketch a rough graph of  $f(x) = -2x(x-2)(2x+1)$  using its zeros.



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1. Lacy and Sydney are making paper flowers for the Junior homecoming float. Lacy makes 6 flowers every minute and Sydney makes 4 flowers every minute. Both girls start at the same time.

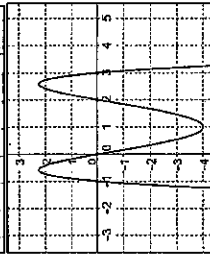
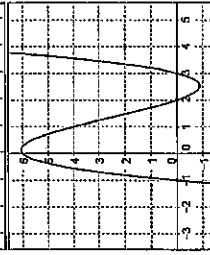
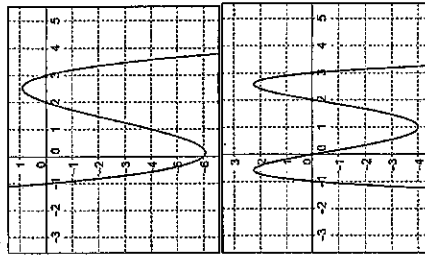
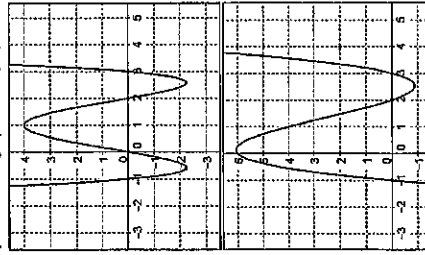
Write and solve an equation to find the number of minutes,  $m$ , it takes Lacy and Sydney to make a total of 600 flowers.

2. Kegan wants to buy a new skateboard that will cost \$140. So far, Kegan has saved \$50 toward the purchase of the skateboard. To raise the remaining money needed, Kegan mows his neighbor's lawn and charges \$10 each time he completes the job.

Write an equation to find  $x$ , the number of times Kegan needs to mow his neighbor's lawn to earn enough money. How many times will Kegan need to mow his neighbor's lawn to have enough money to buy the skateboard?

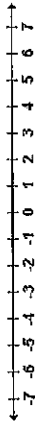
3. Tina scored 94, 68, and 88 on her first 3 Algebra 1 tests. Her next test is her final which counts double. Write and solve an equation that Tina could use to determine the minimum grade she must score on her final to have a mean score of 80.

5. Identify the correct graph of the polynomial function:  $f(x) = -x(x-2)(x-3)(x+1)$ .





4. Rene used a \$4 off coupon to buy bows which cost \$2 each. Write an inequality Rene could use to determine the number of bows she can buy if she plans to spend more than \$8. Then graph the solution set.



5. Palm Beach South Middle School's cafeteria can produce 12 pizzas in one hour, and the cafeteria needs to produce at least 30 pizzas to feed the 6<sup>th</sup> grade students at the school. In order to make sure that all pizzas are cooked in time for lunch, what is the least amount of time the cafeteria must allow for cooking the pizzas?

- A. 2 hours
- B.  $2\frac{1}{2}$  hours
- C. 3 hours
- D.  $3\frac{1}{2}$  hours



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Jordan signed up for the Annual Cross Florida bike ride which is a 170 mile bike ride. After weeks of training he rides at an average of 15 miles per hour. Write and graph an equation that can be used to show Jordan's progress in miles ( $y$ ) after a number of hours ( $x$ ).

Draw Graph Below

2. Lisette is saving money to buy a car. She has \$972 already and adds \$20 per week from her part time job. Which of the following equations represents this situation if  $y$  represents the total amount of money that Lisette has saved?

- A.  $y = 20x + 972$
- B.  $y = 20x - 972$
- C.  $y = -20x - 972$
- D.  $y = -20x + 972$

3. Noah sold 25 hot dogs during the pregame show at a football game. During the game he sells an average of 31 hot dogs per hour. Write an equation to model the number of hotdogs,  $d$ , Noah will have sold after  $h$  hours.



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4. The glee club is selling cupcakes at a local fair. They must pay \$20 to rent a booth and they are selling the cupcakes for \$2 each. Graph their profit or loss, in dollars, against the number of cupcakes they sell.

1. Janice has final exams in Algebra 1 and Biology on Friday. She has up to 12 hours to study for the exams and her mom said she must spend more time on Algebra ( $a$ ) than Biology ( $b$ ). Which of the following constraints can be used to represent this situation?

A.  $\begin{cases} a+b \leq 12 \\ a \geq b \end{cases}$

B.  $\begin{cases} a+b \geq 12 \\ a \geq b \end{cases}$

C.  $\begin{cases} a+b < 12 \\ a > b \end{cases}$

D.  $\begin{cases} a+b \leq 12 \\ a > b \end{cases}$

2. Alyssa emptied out her change jar to buy a new binder for school. She found 147 coins consisting of dimes and nickels that totaled \$11.65. Write a system of equations that could be used to determine how many dimes,  $d$ , and how many nickels,  $n$ , Alyssa had in her change jar.

3. A company is repaving their parking lot and trying to decide how many parking spaces they can make when painting the new lines. The lot has 3200 square feet of room for the parking spaces. A standard car's parking space is 162 square feet and a compact car's parking space is 120 square feet. Select all of the following that are viable solutions to this parking lot situation.

- A. 13 standard cars and 10 compact cars
- B. 10 standard cars and 13 compact cars
- C. 18 standard cars and 6 compact cars
- D. 6 standard cars and 18 compact cars
- E. 19 standard cars and 26 compact cars



Algebra 1  
Secondary Education  
MAFS.912.A-CED.1.4

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Mr. Dominguez wrote the formula below to calculate  $a$ , the acceleration of his motor.

$$a = \frac{v - s}{t - b}$$

Solve Mr. Dominguez's formula for  $t$ , the final time.

2. The movement of moving particles is described in the equation  $r = \frac{ht^2}{2} - 2vt - 2c$ . Solve the equation for  $v$ .

3. Solve the equation below for  $x$ .

$$a = \frac{bx + cx}{2}$$

4. Raymond was asked to come to the board and solve the equation  $h = ab + r$  for  $a$ . What should be Raymond's first step?

- A. Multiply each side of the equation by  $b$ .
- B. Subtract  $r$  from both sides of the equation.
- C. Divide each side of the equation by  $a$ .
- D. Add  $h$  to each side of the equation.

5. Solve the equation  $y - b = m(x - a)$  for  $a$ .

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Algebra 1  
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4. Annalise realized she needed two part-time jobs after school to raise enough money to buy a car within a month after getting her driver's license. She works the same number of hours at each job in one week and receives \$10 per hour to babysit and \$8 per hour to bag groceries. She also spends \$11 per week on lunch at school. Which of the following equations represents the amount of money Annalise earns ( $y$ ) in a week based on the number of hours ( $x$ ) she works?

- A.  $y = 18x + 11$
- B.  $y = 18x - 11$
- C.  $y = 10x + 8$
- D.  $y = 10x - 3$

5. Johnnie likes to buy slices of pizza in the cafeteria for lunch for \$1.75. Amy prefers to buy hamburgers for lunch, which cost \$2.50 each. Between the two of them, Johnnie and Amy have \$15.50. How many hamburgers and slices of pizza can they buy? Sort the following solutions into their appropriate category.

Solutions
3 slices and 2 hamburgers
6 slices and 2 hamburgers
4 slices and 4 hamburgers
2 slices and 6 hamburgers
5 slices and 1 hamburger
1 slice and 5 hamburgers

Categories	
Viabile Solution	Non-Viabile Solution



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Using the table below, explain the process used for each step in solving the equation.

$$4c + 12 - 2c = 5c - 3$$

Steps	Solution Steps	Process
1	$4c + 12 - 2c = 5c - 3$	Given

2. Erica solved the equation below.

$$3(a + 5) = 2a + 35$$

- Step 1  $3a + 15 = 2a + 35$
- Step 2  $5a + 15 = 35$
- Step 3  $5a = 20$
- Step 4  $a = 4$

Which step is the first incorrect step in Erica's solution shown above?

- A. Step 1
- B. Step 2
- C. Step 3
- D. Step 4



3. Ken solved the linear equation  $2(5y - 1) = 18$  using the following steps.

Step 1  $2(5y - 1) = 18$

Step 2  $10y - 1 = 18$

Step 3  $10y = 19$

Step 4  $y = 1.9$

Which statement is true about Ken's method?

- A. Ken made a mistake between Steps 1 and 2.
- B. Ken made a mistake between Steps 2 and 3.
- C. Ken made a mistake between Steps 3 and 4.
- D. Ken solved the equation correctly.

4. List the steps in solving the equation  $16 = 2(4d - 8) - 4$ .

Step 1: \_\_\_\_\_

Step 2: \_\_\_\_\_

Step 3: \_\_\_\_\_

Step 4: \_\_\_\_\_

5. Explain Mia's mistake in solving the equation below.

$$2(y - 5) = 22 - y$$

$$y - 5 = 11 - y$$

$$2y - 5 = 11$$

$$2y = 16$$

$$y = 8$$

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Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Which of the following inequalities is equivalent to  $5a + 4 < 19$ ?

- A.  $a < 3$
- B.  $a < 5$
- C.  $a > 3$
- D.  $a < 10$

2. Graph the solution set on a number line for each inequality listed below.

I.  $-4y < -12$

II.  $2(y + 2) < 8$

III.  $5 - 2y < 2 - y$

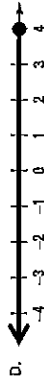
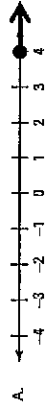
3. Solve  $ab - 8 = 3b$  for  $b$ .

4. Solve the equation below for  $f$ .

$$3 - \frac{2f - 5}{6} = \frac{3 - f}{4}$$



5. Which of the following is the graph of  $2c - 5 \geq 3$ ?





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1. Rewrite the quadratic equation  $2x^2 + 12x + 1 = y$  in vertex form by completing the square.

2. Select all of the solutions to the equation  $2x^2 + 3x - 5 = 0$ .

- A.  $-\frac{5}{2}$
- B.  $-1$
- C.  $\frac{2}{5}$
- D.  $1$
- E.  $\frac{5}{2}$

3. Fill in the missing step of the derivation of the quadratic formula.

$ax^2 + bx + c = 0$
$ax^2 + bx = -c$
$a\left(x^2 + \frac{b}{a}x\right) = -c$
$a\left(x^2 + \frac{b}{a}x + \left(\frac{b}{2a}\right)^2\right) = \frac{b^2}{4a} - c$
$a\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a}$
$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$
$x + \frac{b}{2a} = \pm\sqrt{\frac{b^2 - 4ac}{4a^2}}$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$





4. Select all of the following ordered pairs that are solutions of the equation  $5x^2 - 2x - 8 = 1$ .

- A.  $(-1, 0)$
- B.  $\left(\frac{1}{5}, 0\right)$
- C.  $\left(\frac{7}{5}, 0\right)$
- D.  $\left(\frac{1+\sqrt{46}}{5}, 0\right)$
- E.  $\left(\frac{1-\sqrt{46}}{5}, 0\right)$

5. Find the solution(s) of the equation  $5(x-2)^2 - 20 = 0$ .

1. Mr. Xavier took his 18 students and 9 other chaperones to an amusement park. He paid \$882 for admission. Mrs. Yadira took her 11 students and 4 other chaperones to the same amusement park. She paid \$489 for admission. Which equation should be added to the equation  $18s + 9c = 882$  to determine  $s$ , the amount the amusement park charges for student admission?

- A.  $22s + 10c = 978$
- B.  $11s + 5c = 489$
- C.  $9s + 5c = 441$
- D.  $11s + 4c = 489$

2. Fawn bought a total of 70 cakes for a tea party. She spent \$3,025. Fawn bought vanilla cakes for \$22 each and fruit filled cakes for \$55 each. The system of equations below can be used to find the number of vanilla cakes,  $v$ , and the number of fruit filled cakes,  $f$ , Fawn purchased. Which system of equations has the same solution as the system below?

- A.  $\begin{cases} v + f = 70 \\ 22v + 55f = 3,025 \end{cases}$
- B.  $\begin{cases} 22v + f = 70 \\ 22v + 55f = 3,025 \end{cases}$
- C.  $\begin{cases} v + 55f = 3,850 \\ 22v + 55f = 3,025 \end{cases}$
- D.  $\begin{cases} 22v + 55f = 70 \\ 22v + 22f = 1,540 \end{cases}$



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3. A school treasurer purchased jackets for the school store. She used the system of equations below to determine the price for each student jacket,  $x$ , and the price for each adult jacket,  $y$ . Write a system of equations that has the same solution as the system of equations below.

$$\begin{cases} 84x + 12y = 9,612 \\ 126x + 21y = 13,643 \end{cases}$$

A:

B:

4. Rachel is solving the system of equations  $\begin{cases} 7x - 21y = 14 \\ 2x + 3y = 11 \end{cases}$  using the elimination method. Which of the following steps could she use?

- A. Divide the first equation by 2 and then add the result to the second equation.
- B. Multiply the first equation by 21 then add the result to the second equation.
- C. Multiply the second equation by 3 then add the result to the first equation.
- D. Divide the first equation by 7 then add the result to the second equation.



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5. Mr. Nigma is solving the system of equations  $4x - 3y = 9$  and  $2x + 6y = 5$ . Which system of equations has the same solution as the system that Mr. Nigma is solving?

A.  $\begin{cases} 4x - 3y = 9 \\ -15y = -1 \end{cases}$

B.  $\begin{cases} 4x - 3y = 9 \\ 9y = 19 \end{cases}$

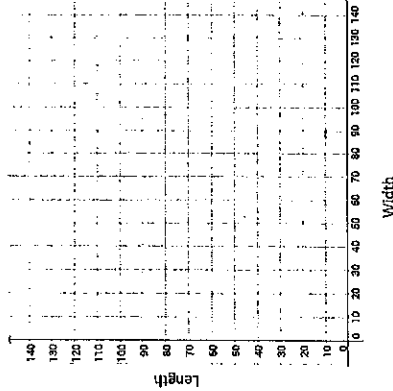
C.  $\begin{cases} 2x + 6y = 5 \\ 6x = 23 \end{cases}$

D.  $\begin{cases} 2x + 6y = 5 \\ 10x = 23 \end{cases}$



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1. Julio wants to make a small scale soccer field in his backyard for his daughter to practice. He has painted off lines to create a perimeter of 270 feet. He has also measured the length of the field to be 35 feet longer than the width of the field. Write and graph the system of equations which could be used to find the length and width of the field.



2. While analyzing the landing procedures of airplanes, George noted one plane at an altitude of 5,000 feet descending at a rate of 300 feet per minute and one at an altitude of 14,000 feet descending at a rate of 4,200 feet per minute. Which of the following solutions represents when the two airplanes will reach the same altitude?

- A. (6, 3200)
- B. (10, 2000)
- C. (12.7, 1190)
- D. (21, 1300)



3. Three times a number is subtracted from another number and the difference is 3. The sum of the two numbers is 31. What is the smaller of the two numbers?

4. Solve the system of equations below.

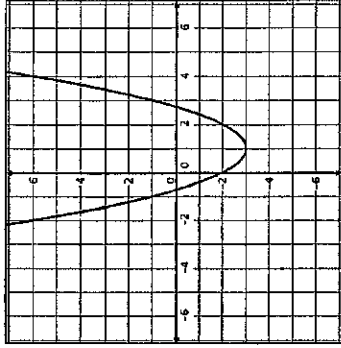
$$\begin{cases} x + y = 21 \\ 2x = 33 + y \end{cases}$$

5. Solve the system of equations below.

$$\begin{cases} -5x - 8y = 17 \\ 2x - 7y = -17 \end{cases}$$

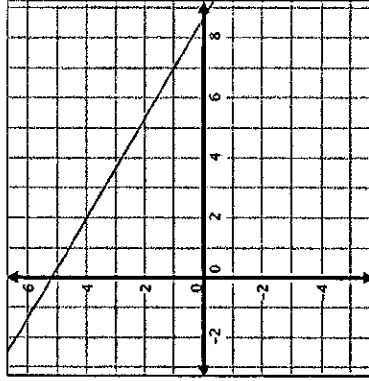
1. Which of the following is a solution of the function graphed below?

- A. (2.75, 0)
- B. (0, 0.75)
- C. (6, -2)
- D. (2, 1)

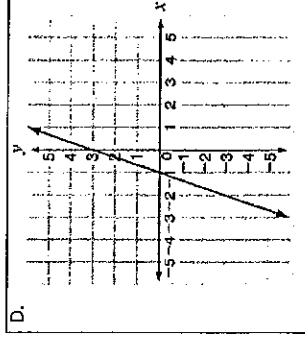
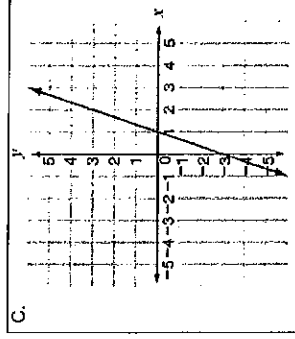
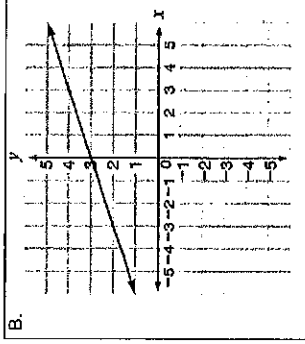
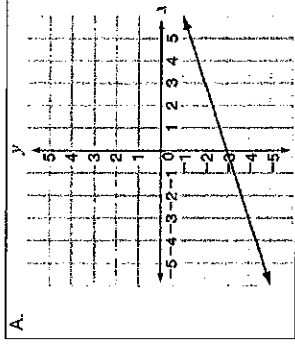


2. Select all the points that are in the solution set graphed below.

- A. (5, 3)
- B. (2, 4)
- C. (4, 2)
- D. (7, 1)
- E. (0, 6)

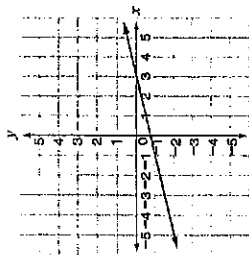


3. Which graph represents the solution to the equation  $x - 3y = -9$ ?





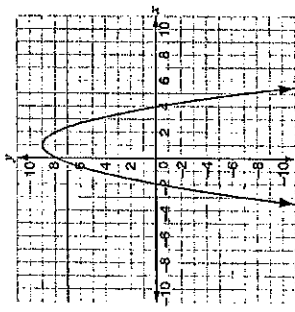
4. Ravi graphed the solution set of an equation below.



Which equation did Ravi solve?

- A.  $x + 4y = -3$
- B.  $x - 4y = -3$
- C.  $x + 4y = 3$
- D.  $x - 4y = 3$

5. Which of the following is a solution of the equation graphed below?



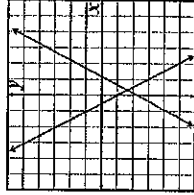
- A.  $(-2, 0)$
- B.  $(-1, 0)$
- C.  $(0, 0)$
- D.  $(9, 1)$



Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What is the solution to  $f(x) = g(x)$ , if  $f(x) = -x$  and  $g(x) = x$ .

2. The graphs of  $f(x)$  and  $g(x)$  are shown below. Which of the following is closest to the solution of  $f(x) = g(x)$ ?



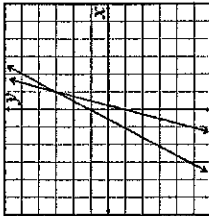
- A.  $(-1.6, 0.2)$
- B.  $(0, -1)$
- C.  $(0.2, -1.6)$
- D.  $(0.5, -2)$

3. The table below shows the results of evaluating two functions,  $f(x)$  and  $g(x)$ , for different values of  $x$ . Using this information, give an approximate solution to the nearest hundredth for  $f(x) = g(x)$ .

$x$	$f(x)$	$g(x)$
1.2	2.4	1.7
1.3	2.7	2.2
1.4	3.0	2.7
1.5	3.3	3.4
1.6	3.6	4.1
1.7	3.9	4.9



4. The graphs of  $f(x)$  and  $g(x)$  are shown below. Which of the following is the solution of  $f(x) = g(x)$ .



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

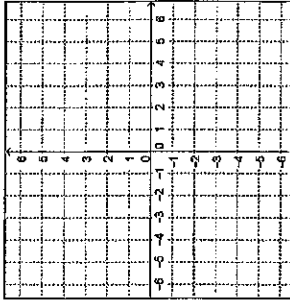
5. Complete the table of successive approximations to find the  $x$ -value of the solution of  $f(x) = g(x)$  to the nearest hundredth.

$x$	$f(x) = x^2 - 2$	$g(x) = x - 1$
0	-2	-1
1	-1	0
2	2	1
1.5	0.25	0.5

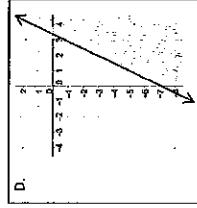
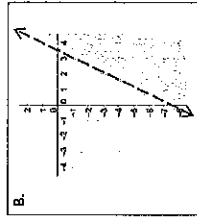
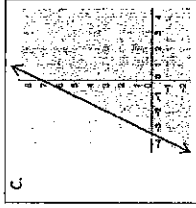
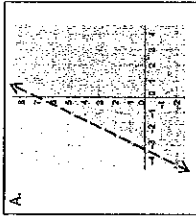


Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Graph the inequality  $4x + y > 1$ .



2. Which of the following graphs represents the inequality  $y < 2x + 7$ ?





Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Eli needs to place buoys at specific points in the inlet. He used the expression  $x^4 - 81$  to find the location for each buoy. Which expression is equivalent to Eli's expression?

- A.  $(x^2 - 9)^2$
- B.  $(x + 3)(x - 3)$
- C.  $(x^2 - 9)(x - 3)(x + 3)$
- D.  $(x^2 + 9)(x - 3)(x + 3)$

2. Andre wrote the expression below in his mathematics notes. Write an equivalent expression that shows the greatest common factor of Andre's expression.

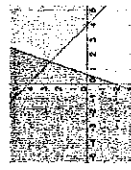
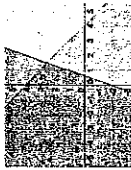
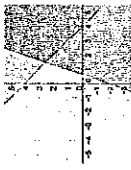
$$2x^2 - 10x^2y + 7x^2y^2 - 9x^2y^3$$

3. The area of a rectangular field is represented by  $2x^2 + 13x + 21$ . What are the length and width of the field?



3. Which of the following represents the solution set to the system of inequalities?  

$$\begin{cases} y \geq -x + 4 \\ y \geq 3x - 2 \end{cases}$$



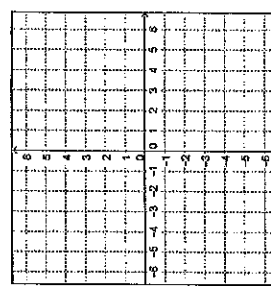
4. Select all of the ordered pairs that are in the solution set of the system of inequalities given.

$$\begin{cases} 6x + 2y > 1 \\ y < 5x + 3 \end{cases}$$

- A. (-3, 1)
- B. (0, -3)
- C. (3, 3)
- D. (-7, 4)
- E. (1, 1)
- F. (4, -2)

5. Graph the system of inequalities:

$$\begin{cases} y \geq 6x - 4 \\ x + 3y < 6 \end{cases}$$





Algebra 1  
Secondary Education  
MAFS.912.A-SSE.1.1

4. Select all of the expressions that are NOT equivalent to  $ax + bx + ac + bc$ .

- A.  $x(a+b) + c(a+b)$
- B.  $a(x+c) + b(x+c)$
- C.  $(b+a)(c+x)$
- D.  $ax + bc$
- E.  $(a+b)(x+c)$
- F.  $ab(x+c)$

5. Nlara is writing a computer program for three-dimensional graphics. Part of her program applies the expression  $27x^3 + 8y^3$ . Which expression is equivalent to  $27x^3 + 8y^3$ .

- A.  $(3x+2y)(3x-2y)(3x+2y)$
- B.  $(3x+2y)(9x^2 - 6xy + 4y^2)$
- C.  $(3x+2y)(3x-2y)^2$
- D.  $(3x-2y)^3$



Algebra 1  
Secondary Education  
MAFS.912.A-SSE.1.2

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Which expression is equivalent to  $4x^2 - 49$ ?

- A.  $(2x+7)^2$
- B.  $(2x-7)^2$
- C.  $(x+7)(4x-7)$
- D.  $(2x+7)(2x-7)$

2. Select all of the factors of the expression  $5x^2 - 405$ .

- A. 5
- B. 9
- C.  $x+9$
- D.  $x-9$
- E.  $5x-9$

3. Match each expression with an equivalent expression.

$x^2 - 6x + 9$	$(x-3)(x+3)$	$(x-3)(x-3)$	$(x+3)(x+3)$
$x^2 + 6x + 9$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$(x^2 - 9)$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





4. Use factoring to write an expression that is equivalent to  $25b^{15} - 64c^3$ .

5. Write the expression  $7x^3 - 28xy^2$  as the product of 3 factors.



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Monique has been tracking the jumps of frogs in her backyard to collect data for a project. She found that the height of a frog's jump in inches can be modeled by the expression  $t - \frac{1}{4}t^2$ , where  $t$  is the time in seconds. Write an equivalent expression to easily show the times at which the frog is on the ground.

2. Claudio is clearing out a field for the neighborhood kids to play. The area of the field can be represented by the expression  $w^2 + 28w - 1100$ , where  $w$  is the width of the field. Use the options below to identify an equivalent expression that reveals the width of the field.

- A.  $(w + 14)^2 - 1296$
- B.  $w(w + 28) - 1100$
- C.  $(w + 50)(w - 22)$
- D.  $(w - 50)(w + 22)$

3. Sonja has decided to try out for the track and field team at her high school and would like to be able to jump the hurdles. She did some research to find that if her jump models the expression  $-2x^2 + 24x - 2$ , she can clear a 68cm hurdle without any problem. Write an equivalent expression to easily show the maximum height Sonja must be able to jump.



Algebra 1  
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4. Anna received a gift of \$5,000 from her grandmother and decided to invest it. The expression  $5000(1.0005)^{12t}$  represents the amount of money Anna is earning on her investment. Select all of the following that are equivalent expressions so that Anna can better understand how her money is invested.

- A.  $5000(1.0005)^{12t}$
- B.  $(5000 + 2.5)^{12t}$
- C.  $5000(1 + .0005)^{12t}$
- D.  $5000\left(1 + \frac{.06}{12}\right)^{12t}$
- E.  $5000(1.0005^t)^{12}$
- F.  $5025^{12t}$

5. A function for a popular amusement park ride in Ohio is defined by the expression  $-16s^2 + 64s - 60$ , where  $s$  is the time in seconds. Which of the following is an equivalent expression that reveals the zeros of the function?

- A.  $-16(s-2)^2$
- B.  $(2s-5)(2s-3)$
- C.  $-4(s-6)(s-10)$
- D.  $-4(2s-5)(2s-3)$



Algebra 1  
Secondary Education  
MAFS.912.F-BF.1.1

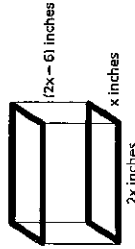
Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Mrs. Rice asked his class to find the value of the function  $h(x) = f(x) - g(x)$ . What is the value of  $h(x) = f(x) - g(x)$ , if  $f(x) = 2x + 3$  and  $g(x) = 4x^2 - 5x$ ?

2. The function  $f(x) = (3x)^3$  is used to determine the area of a sandbox, where  $x$  is the number of children the sandbox is designed to hold. The function  $g(x) = (2x + 3)^2$  is used to determine the area a park needs to hold a merry go round, where  $x$  is the maximum number of children the merry go round can hold. Which expression could be used to determine  $A(x)$ , the area needed for a park to have both a sandbox and a merry go round?

- A.  $A(x) = 13x^2 + 12x + 9$
- B.  $A(x) = 9x^2 + 21x + 9$
- C.  $A(x) = 13x^2 + 9$
- D.  $A(x) = (5x + 3)^2$

3. Gavin needs to fill the fish tank below with water. The directions state that the water level should be 2 inches below the top of the tank. Write an expression to show the volume of water Gavin needs to fill the tank according to the directions.





4. Kevin uses the function  $M(x) = 7x^2 + 5x^2 + 2x + 200$  to determine the current in his main circuit. The function  $B(x) = 3x^2 + 2x^2 + x + 100$  is used to determine the current in Kevin's backup circuit. What is the difference in the current in Kevin's main circuit and his backup circuit?

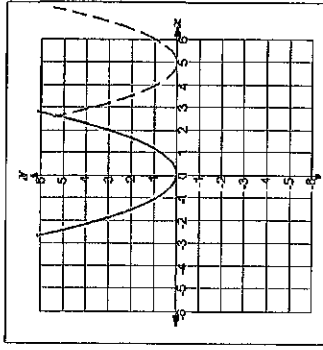
5. Mr. Smyth uses the function  $L(x) = 2x^2$  to determine the length, in feet, of his landscaping projects. He uses the function  $W(x) = 5x - 2$  to determine the width, in feet, of each project. Which function could Mr. Smyth use to determine the price,  $P(x)$ , for a rectangular project if he charges \$20 per square foot.

- A.  $P(x) = 10x^2 - 4x$   
 B.  $P(x) = 2x^2 + 5x - 2$   
 C.  $P(x) = 200x^2 - 80x^2$   
 D.  $P(x) = 40x^2 + 100x - 40$



Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. The function  $f(x) = x^2$  and its transformation,  $g(x) = (x - k)^2$ , are shown below. What is the value of  $k$ ?




2. Given the function  $f(x)$ , what is the transformation  $f(x) + r$ , if  $r$  is a real number and  $r > 0$ ?
- A. The graph shifts  $r$  units down.  
 B. The graph shifts  $r$  units up.  
 C. The graph shifts  $r$  units right.  
 D. The graph shifts  $r$  units left.
3. Given the function  $f(x)$ , what is the transformation  $f(x - r)$ , if  $r$  is a real number and  $r > 0$ ?
- A. The graph shifts  $r$  units down.  
 B. The graph shifts  $r$  units up.  
 C. The graph shifts  $r$  units right.  
 D. The graph shifts  $r$  units left.

4. Given the function  $f(x)$ , explain how the transformation  $4f(x)$  changes the graph of  $f(x)$ .

5. Given the function  $y = 2^x$ , complete the table for the transformation  $y = 2^x - 3$ .

x	y
0	
1	
4	
9	

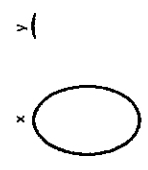
Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Complete the function by entering values from the box below into the table.

2, 5, 10

x	y
1	2
2	5
3	
2	

2. Which of the following statements accurately describes the mapping diagram below?



- A. This diagram is not a function because 7 is used twice.
- B. This diagram is a function, since no domain values are repeated.
- C. This diagram is not a function because there are too many domain values.
- D. This diagram is not a function because there aren't enough range values.

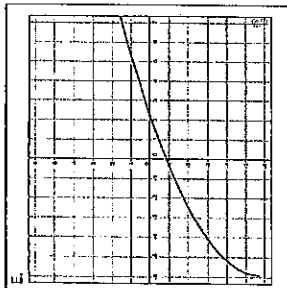
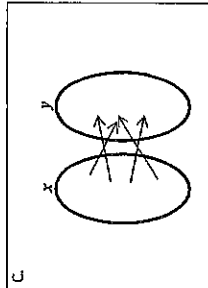
3. Which of the relations below is not a function?

- A.  $\{(2, 7), (4, 13), (6, 19), (8, 25)\}$
- B.  $\{(5, 2), (7, 2), (9, 2), (11, 2)\}$
- C.  $\{(3, 1), (3, 4), (3, 9), (3, 16)\}$
- D.  $\{(-8, 8), (-7, 7), (-6, 6), (-5, 5)\}$

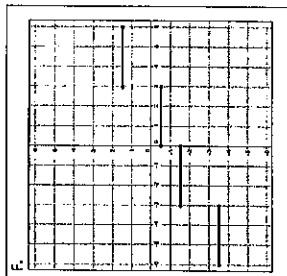
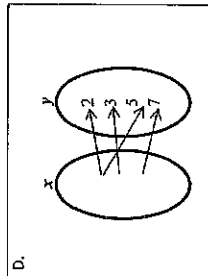


4. Select all of the following that are functions.

- A.  $\{(2, 4), (4, 2), (3, 4), (4, 3)\}$

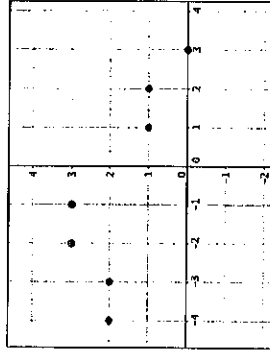


- B.  $\{(3, 13), (2, 12), (4, 14), (6, 16)\}$



5. After graphing the function below, Brenda noticed that one point was missing. Which of the following is the missing point in Brenda's graph?

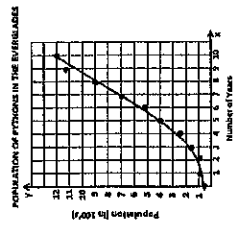
- A.  $(0, 3)$   
B.  $(1, 2)$   
C.  $(2, -1)$   
D.  $(3, 2)$





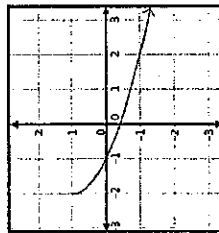
Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Florida Fish and Wildlife is having problems with the growing population of Pythons in the Everglades. The graph below shows the annual growth of the python population from 2000 to 2010. What is the domain of the graph that is shown?



- A.  $x > 0$   
B.  $x \leq 10$   
C.  $0 \leq x \leq 10$   
D.  $0 \leq x \leq 1200$

2. Melody graphed the function below to model the results of her experiment. What is the domain of Melody's function?

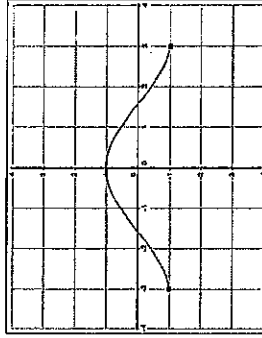


3. Tori has a cell phone plan that charges \$0.09 for each text message sent. Tori plans to spend no more than \$40 per month on her texting bill. If  $c(t) = 0.09t$  represents the total phone bill based on the number of texts ( $t$ ) that Tori sends each month, what is the domain of the function?

4. Aron wrote the function  $f(x) = 25x - 15$  find the amount of money he would make after washing  $x$  cars. Select all of the values below that are in the domain of Aron's function.

- A. 2  
B. 2.3  
C. 5  
D. 7.1  
E. 10

5. Identify the domain of the function graphed below.





Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Neal listed the number of flowers that bloomed in his garden each week.

2, 4, 8, 16, 32, 64, ...

Which formula accurately models the sequence above if  $a_1 = 2$ ?

- A.  $a_n = 2a_{n-1}$
- B.  $a_n = 2a_{n-2}$
- C.  $a_n = 2a_{n+2}$
- D.  $a_n = 2a_{n+1}$

2. Adina found the sequence below on a discussion board.

10, 3, -4, -11, -18, -25

Identify  $a_1$  and complete the recursive rule for  $a_n$ .

$a_1 =$

$a_n =$



3. The Moon Dollars Coffee Shop gives free gift cards to some of its customers. Jean noticed that the gift cards are given to customers following the pattern below.

8, 29, 50, 71, 92, ...

Write a recursive rule Jean could use to determine the customer number she needs to be to win the next free gift card?

$a_1 =$

$a_n =$

4. The South Bay Skate Board company makes 10,000 skateboards each day. The sequence below shows which skateboards are chosen for inspection.

4, 12, 36, 108, ...

Identify the value of  $a_1$ , and write a rule for  $a_n$ .

$a_1 =$

$a_n =$



5. Carlie used the sequence below to select students for an August survey.

19, 23, 27, 31, 35, ...

Carlie decided to use the same recursive rule for her September survey, but she wants her first student to be number 20. Identify the value of  $a_1$ , and write a rule for  $a_n$ .

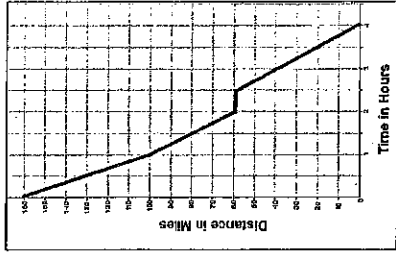
$a_1 =$

$a_n =$

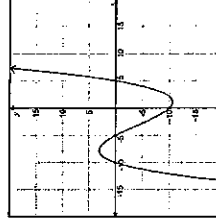
Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. The ROTC cadets traveled to Eglin Air Force Base during a field trip. The graph below shows the cadets' distance from Eglin Air Force Base over time. Identify the time interval,  $x$ , during which the cadets travel the fastest.

$\leq x \leq$



2. Steve generated a function to model how the change in memory used by his new computer program ( $x$ ) affects the processor speed,  $f(x)$ . Identify the values of the domain where Steve's program shows no effect on processor speed.



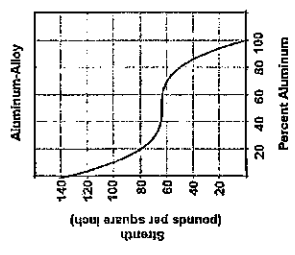




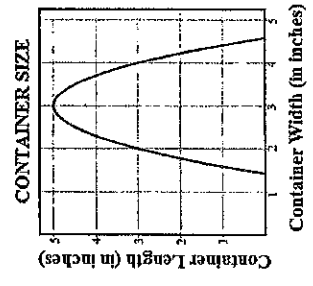
5. Mr. Downey used the function,  $f(x) = -3x^2 + 12x$  to model the flight of a glider. In Mr. Downey's function,  $x$  is the amount of time that passes in minutes and  $f(x)$  is the glider's distance from the ground in feet. After how many seconds will the glider reach its maximum distance from the ground?



3. Mr. Stark is developing a new alloy by adding aluminum to a gold-titanium mixture. The graph below shows how the strength of Mr. Stark's alloy,  $f(x)$ , is affected by the percentage of aluminum,  $x$ , included in the mixture. Over what interval does the strength of Mr. Stark's new alloy decrease?

  $\leq x \leq$  


4. Alexa graphed the function below to show the relationship between the width and length of the containers her company produces. According to her graph what is the length,  $f(x)$ , of the largest container her company makes?





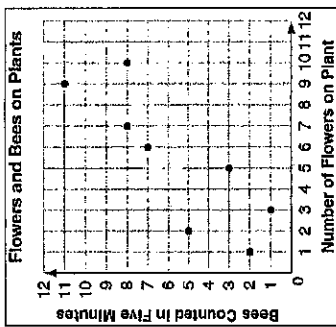
Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Darius started his baseball card collection with 7 cards that he got from his dad. He bought 1 pack of cards each month for 20 years. After 1 year he had 79 cards in his collection. Darius gave his entire collection to his son 20 years after he got it from his dad. Which of the following is the domain of the function representing the number of baseball cards in Darius's collection?

- A.  $7 \leq x \leq 1,560$
- B.  $7 \leq x \leq 1,447$
- C.  $0 \leq x \leq 21$
- D.  $0 \leq x \leq 20$

2. Eva graphed the results of her study below. Which of the following is the domain of Eva's graph?

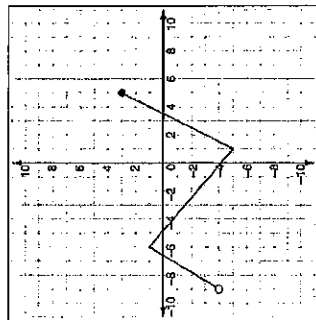
- A.  $0 \leq x \leq 11$
- B.  $0 \leq x \leq 10$
- C.  $\{1, 2, 3, 5, 7, 8, 11\}$
- D.  $\{1, 2, 3, 5, 6, 7, 9, 10\}$



3. Russell made a graph for a project which shows the relationship between the time in seconds,  $x$ , that a football is in the air after it is thrown and the number of feet,  $f(x)$ , the football travels. Which of the following is the most appropriate domain for Russell's graph?

- A.  $x \leq \infty$
- B.  $x \geq 0$
- C.  $0 \leq x \leq 10$
- D.  $0 \leq x \leq 100$

4. Ronald drew the graph below to model the relationship between two variables in a study.



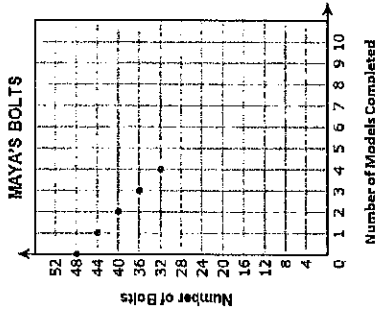
Select all of the values that are in the domain of Ronald's graph.

- A. -10
- B. -9
- C. -5
- D. 5
- E. 6



5. Maya keeps her bolts in a large box in her garage. The total number of bolts in the box,  $f(x)$ , is determined by the number of models ( $x$ ) that she builds. The graph below shows that this relationship is a linear function. Which of the following would be the largest possible value in the domain of Maya's function?

- A. 4
- B. 10
- C. 11
- D. 12



Calculator Neutral  
for this Standard

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Barbara bought a new mango tree and planted it in her back yard. She drew the table below to chart the growth of her new tree. Based on the table, at what rate is Barbara's tree growing?

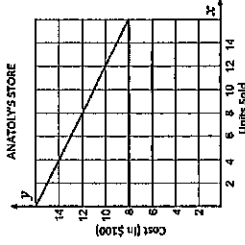


Time (Weeks)	Height (cm)
1	122.3
2	124.6
3	126.9
4	129.2
5	131.5
6	133.8

2. What is the slope of the linear model  $y = 3.0x - 14$ ?

- A. 5.0
- B. 0.5
- C. 3.0
- D. 1.0

3. Anatoly graphed his store's costs below. Which statement best describes the rate of change in Anatoly's graph?



- A. Anatoly cost decreased by \$800.
- B. Anatoly's business has a cost of \$1,500.
- C. Anatoly's costs decrease by \$50 for every unit sold.
- D. Anatoly's costs increase by \$200 for every unit sold.



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

4. The table shows a linear model describing the change in depth of the Mississippi river in respect to the rainfall total for the month. What is the slope for this linear model?

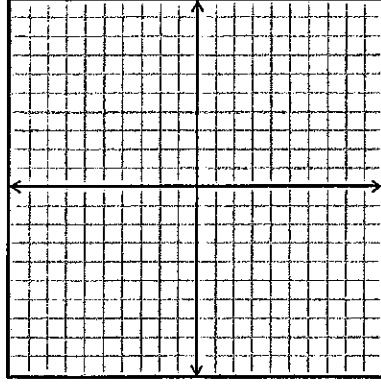
Rainfall (in inches)	River Change (inches)
2	9.0
3	13.5
4	18.0
5	22.5
6	27.0
7	31.5

- A. 2.5
- B. 4
- C. 4.5
- D. 5

5. What does the slope of a linear model represent?

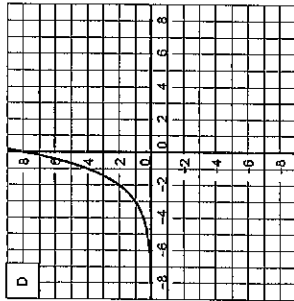
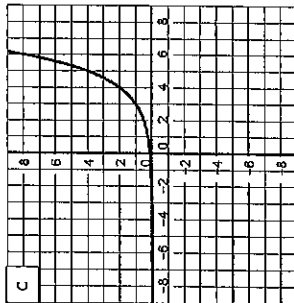
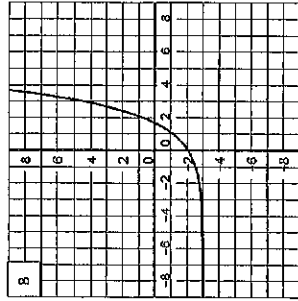
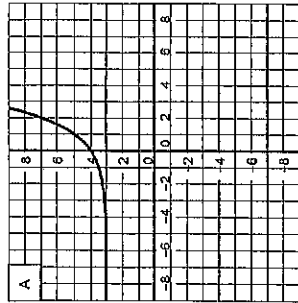
- A. The value of the x-intercept.
- B. The value of the y-intercept.
- C. The value of the independent variable when the dependent variable equals zero.
- D. How quickly the dependent variable changes with respect to the independent variable.

1. Graph the function  $f(x) = (x - 4)^2 + 5$

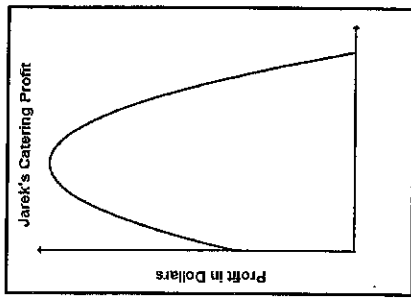




2. Identify the graph of the function:  $f(x) = 2^x + 3$



3. To increase his profit, Jarek decides to raise the price of his catering services. He experimented with different prices and developed the function graphed below. What does the vertex of Jarek's graph represent?



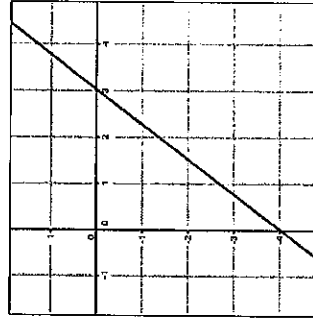
- A. Jarek's maximum possible profit.
- B. Jarek's maximum possible price.
- C. Jarek's minimum possible profit.
- D. Jarek's minimum possible price.

4. Identify the x-intercept, y-intercept, and the slope of the function graphed below.

x-intercept

y-intercept

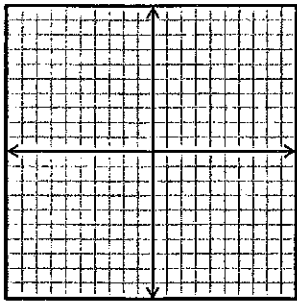
slope





5. Graph a linear function with a slope of  $-\frac{2}{3}$  and the same y-intercept as the function below.

$$f(x) = \frac{2}{3}x + 3$$



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Identify the vertex and axis of symmetry for the graph of the equation below.

$$y = 3x^2 + 12x + 7$$

Zeros: \_\_\_\_\_

Vertex: \_\_\_\_\_ Axis of Symmetry: \_\_\_\_\_

2. Raven graphed the function  $f(x) = -x^2 + 8x$ . Which of the following is the vertex of Raven's graph?

- A. (4, 16)
- B. (-4, 16)
- C. (4, -16)
- D. (-4, -16)

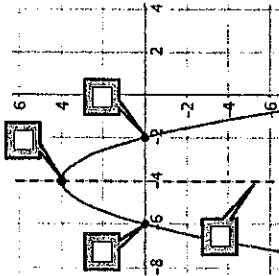
3. Write the function  $f(x) = x^2 - 6x + 8$  in vertex form and identify the axis of symmetry.

Vertex Form

Axis of Symmetry



4. Select the zeros of the function graphed below.



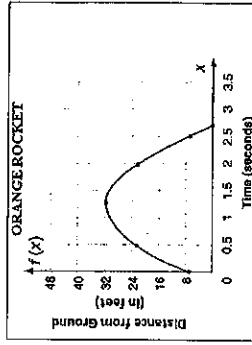
5. Mr. Underwood uses the function  $f(x) = 12,000(1.065)^x$  to calculate the growth of his savings account. Which of the following is Mr. Underwood's interest rate?

- A. 65%
- B. 6.5%
- C. 0.65%
- D. 0.065%



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

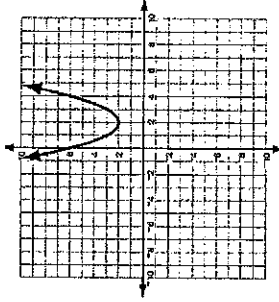
1. Autumn's class launched an orange rocket and a green rocket during an experiment. The function graph below models  $f(x)$ , the orange rocket's distance from the ground, in feet,  $x$  seconds after it was launched. The function  $g(x) = -16x^2 + 36x + 10$  models the green rocket's distance from the ground, in feet,  $x$  seconds after it was launched. Which rocket had the greatest distance from the ground? What was its distance?



Rocket

Distance

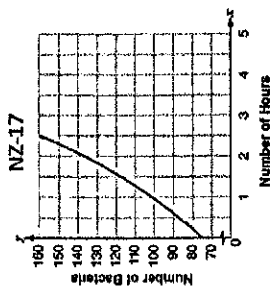
2. Leon needs to choose the function with the greatest distance from the y-axis. He is considering the function  $f(x)$  which is graphed below and the function  $g(x) = x^2 - 6x + 10$ . Which function has an axis of symmetry at a greater distance from the y-axis?





Algebra 1  
Secondary Education  
MAFS.912.F-IF.3.9

3. Rolph is studying the growth of the NZ-17 and the RH-22 bacteria. His results are displayed in the table and graph below.



**RH-22**

Time (in hours)	Number of Bacteria
0	100
1	120
2	144

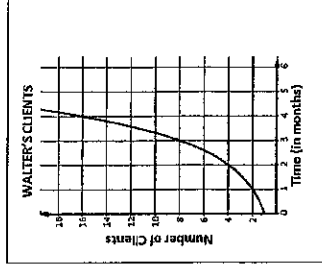
Which of the following is an accurate comparison of NZ-17 and RH-22 bacteria?

- A. The initial population of NZ-17 is more than the initial population of RH-22.
- B. The populations of RH-22 and NZ-17 will never be equal at the same time.
- C. The population of NZ-17 is greater than the population of RH-22 after 3 hours.
- D. The rate of growth of NZ-17 is less than the rate of growth of RH-22.



Algebra 1  
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4. Ronaldo stated that the number of clients his business serves increases according to the function  $R(x) = 4x$ . Walter stated that the graph below models the increase in the number of clients his business serves. Whose business is increasing the fastest?







5. Warrick and Charlie are recording their distance from the ground  $t$  seconds after jumping from a trampoline. The table below shows the time,  $t$ , in seconds and Warrick's distance,  $W(t)$ , in meters  $t$  seconds after jumping from the trampoline. The function  $C(t) = -2t^2 + 4t + 5$  models Charlie's distance  $C(t)$  in meters  $t$  seconds after jumping from the trampoline. Who stayed in the air longer?

--	--

$t$	$W(t)$
0	7
0.5	9
1	10
1.5	10
2	9
2.5	7
3	4
3.5	0



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Mrs. Robinson made the table below showing the yearly balance of her savings account. Interest on the account compounds annually. Which of the following describes the best model to be used for Mrs. Robinson's data?

Year	Balance in Dollars
0	400
5	463.71
10	537.57
15	623.19
20	722.44
25	837.51

- A. an exponential decay function  
 B. an exponential growth function  
 C. a linear function with a positive slope  
 D. a linear function with a negative slope

2. For his science lab assignment Gianni needed to grow cells and record his results at the end of each day. The number of cells at the end of certain days in Gianni's experiment is listed in the table below. Identify the type of function that represents the data in the table below along with its rate of change or growth factor.

Function Type

Rate of Change or Growth Factor

Days	Number of cells
0	243
1	486
2	972
3	1,944
4	3,888
5	7,776



Name: \_\_\_\_\_ Date: \_\_\_\_\_

3. Rankin put himself on a strict budget for the summer. He made one deposit of \$15,000 to an expense account and withdraws \$600 each week. Which of the following could be used to model Rankin's budget?

- A.  $f(x) = 800x + 15,000$
- B.  $f(x) = -800x + 15,000$
- C.  $f(x) = 800x + 15,000$
- D.  $f(x) = -800x + 15,000$

4. Ricon wrote the statements below to help a friend understand what an exponential function is. Select all of the statements that describe exponential functions.

- A. The number of students joining a group increases by 3% each month.
- B. The number of students joining a group increases by 3 each month.
- C. The amount of money in an account decreases \$789 per year.
- D. The amount of money in an account decreases 15% per year.
- E. The number of cells in an experiment doubles every hour.

5. Dr. Banner monitored the decay of a new material he developed for his gamma radiation study. He noted that the decay of the material could be modeled with a function that has a decay rate of 3% per year. Which of the functions below could model the decay rate of Dr. Banner's material?

- A.  $f(x) = 100(0.97)^x$
- B.  $f(x) = 100(1.03)^x$
- C.  $f(x) = 100(103)^x$
- D.  $f(x) = 100(97)^x$

1. Carson stands dominoes in a pattern as follows: (3, 5, 7, 9,...). Write an explicit function to calculate the number of dominoes in any row of Carson's pattern. What would be the value of the tenth term?

Explicit function:

Value of 10<sup>th</sup> term:

2. Training World magazine suggests that beginner runners build their training by increasing the minutes that they run each day using the sequence (7, 17, 27, 37,...) until they have completed a marathon. Which of the following is the recursive definition of this arithmetic sequence?

- A.  $a_n = a_{n-1} + 10; a_1 = 7$
- B.  $a_n = a_{n-1} - 10; a_1 = 7$
- C.  $a_n = a_{n-1} + 10; a_1 = 0$
- D.  $a_n = a_{n-1} - 10; a_1 = 0$

3. Zack's Italian Pizza Bar baked 2,000 pizzas in the first year that they were open. In the second year, they baked 3,000 pizzas and in the third year 4,000 pizzas. Write a function that could model the growth of pizzas baked, where  $x = 0$  is the first year.



4. A new strain of a bacteria found in certain cheese products reproduces in a sequence of 3, 9, 27, 81, ... molecules per day. Select the recursive formula that shows the growth of these bacteria.

- A.  $a_n = 3a_{n-1}; a_1 = 0$
- B.  $a_n = 3a_{n-1}; a_1 = 3$
- C.  $a_n = \frac{1}{3}a_{n-1}; a_1 = 1$
- D.  $a_n = \frac{1}{3}a_{n-1}; a_1 = 3$

5. Lisa saw a funny cat video on a website and checked every day to see how many views it had. The first day had 120 views, the second day had 360 views and the third day had 1,080 views. Assuming this pattern continues, write a function that can model the number of views Lisa's cat video has on day  $x$ .

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Brice used the functions  $f(x)$  and  $g(x)$  to describe the growth of two different variables in an experiment. Determine which function is exponential and justify your choice using the table of values.

$x$	$f(x)$	$g(x)$
0	1	0
1	2	2
2	4	8
3	8	18
4	16	32

2. Rene graphed the functions  $f(x) = 2^x$  and  $g(x) = x^2$ . Which statement best compares the values of  $f(x)$  and  $g(x)$  in Rene's graphs?

- A.  $f(x)$  will always be greater than  $g(x)$
- B.  $g(x)$  will always be greater than  $f(x)$
- C.  $f(x)$  will never equal  $g(x)$
- D.  $f(x)$  increases faster than  $g(x)$

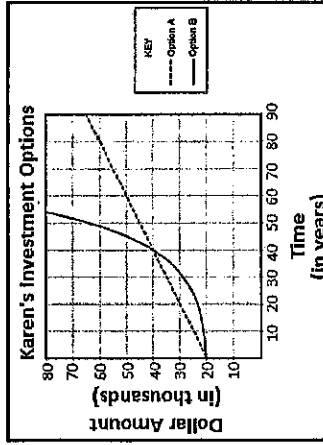


3. The functions  $f(x)$  and  $g(x)$  represent the new balance of two different bank accounts  $x$  years after the same initial deposit was made.

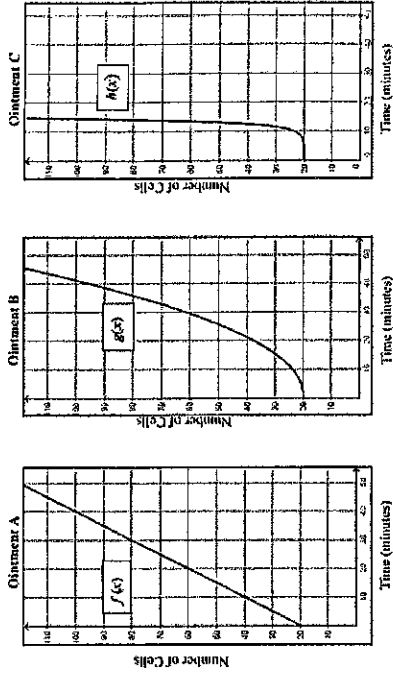
$x$	$f(x)$	$g(x)$
Year 12	\$158.76	\$135.71
Year 13	\$168.29	\$140.44
Year 14	\$178.39	\$245.18
Year 15	\$189.09	\$149.91
Year 16	\$200.43	\$154.64
Year 17	\$212.46	\$159.38

Determine which function is exponential. Use the table of values to justify your choice.

4. Karen is trying to determine how to invest her most recent bonus. She explored two options. Karen's financial advisor graphed her options below. After how many years will Option B always be more beneficial to Karen?



5. Karl is studying antibiotic ointments. He graphed the functions  $f(x)$ ,  $g(x)$ , and  $h(x)$  below to model the result of applying 3 different ointments.



Which of the following is not one of the functions Karl graphed?

- A. Linear Function
- B. Exponential Function
- C. Rational Function
- D. Quadratic Function



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Mrs. Robinson made the table below showing the number of cells in a biology experiment after a number of days. Which type of function best models Mrs. Robinson's data?

Days	Number of Cells
2	4
3	8
4	16
5	32
6	64
7	128

- A. an absolute-value function  
B. an exponential function  
C. a quadratic function  
D. a linear function

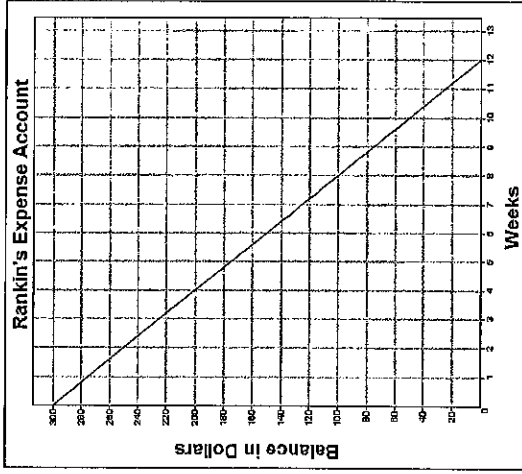
2. Gianni planted a sunflower and recorded its height, in inches, at the end of each month. He made the table below using the heights he has collected so far. How tall was the sunflower when Gianni planted it? At what rate is the sunflower growing?

Original Height:

Rate of Growth:

Month	Height
5	27
6	32
7	37
8	42

3. Rankin put himself on a strict budget. He made one deposit to an expense account and limited himself to a regular weekly withdrawal amount. The graph below shows Rankin's expense account.



- What does the y-intercept mean in the context of this situation?

- What does the slope mean in the context of this situation?

- What does the x-intercept mean in the context of this situation?



Algebra 1  
Secondary Education  
MAFS.912.N-RN.1.1

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Ned shows that  $\sqrt[3]{16} = 16^{\frac{1}{3}}$ . Part of his work is shown below. Which expression or equation can be placed in the blank to correctly complete Ned's work?

$$\sqrt[3]{16} = 4 = 4^1 = 4^{\frac{1 \cdot 1}{1 \cdot 1}} = \frac{4^{\frac{1}{3}}}{4^{\frac{2}{3}}} = \frac{4^{\frac{1}{3}}}{4^{\frac{2}{3}}} = 16^{\frac{1}{3}}$$

- A.  $(4^{\frac{2}{3}})^1$   
 B.  $4^{\frac{2}{3}} + 4^{\frac{2}{3}}$   
 C.  $4^{\frac{2}{3}} \cdot 4^{\frac{2}{3}} = (4 \cdot 4)^{\frac{2}{3}}$   
 D.  $4^{\frac{2}{3}} \cdot 4^{\frac{2}{3}} = (4 \cdot 4)^{\frac{2}{3} + \frac{2}{3}}$

2. Select all of the expressions that are equivalent to the expression  $(64)^{\frac{2}{3}}$ .

- A.  $\sqrt[3]{16}$   
 B. 16  
 C.  $4^2$   
 D.  $\sqrt{64^3}$   
 E.  $\sqrt[3]{64^2}$   
 F.  $(\sqrt[3]{64})^2$

3. Larry and Jen are working together to simplify the expression  $\sqrt[3]{125^3}$ .

Larry's work shows:  $125^3 = 5$

Jen's work shows:  $125^3 = 25$

Who is correct? Explain.



Algebra 1  
Secondary Education  
MAFS.912.F-LE.2.5

4. Ricou has been asked to increase the number of participants in his school's volunteer group. In his presentation to the student council he stated that the function below models the group's growth potential over the next  $x$  months. What does the rate of change of Ricou's function represent?

$$f(x) = 7x + 45$$

- A. The number of students joining the group each month.  
 B. The number of students currently in the group.  
 C. The total number of students joining the group.  
 D. The number of students in the group after 12 months.

5. Dr. Banner monitored the decay of a new type of recyclable material he developed for his gamma radiation study. He noted that the decay of the material could be modeled by the function  $f(x) = 100(0.98)^x$ . What is the rate of decay of Dr. Banner's material?

4. Rewrite the expression  $\left(7^{\frac{1}{2}}\right)\left(7^{\frac{1}{3}}\right)$  as a radical.

5. Match the expressions in the first column to their equivalent expression in the second column.

- |  |                          |                    |
|--|--------------------------|--------------------|
| A. $(13^3)^{\frac{1}{2}}$                        | <input type="checkbox"/> | $(\sqrt[4]{13})^4$ |
| B. $(13^2)^{\frac{1}{2}}$                        | <input type="checkbox"/> | $\sqrt{13^2}$      |
| C. $(13^2)^{\frac{3}{2}}$                        | <input type="checkbox"/> | $\sqrt{13^2}$      |
| D. $\left(13^{\frac{2}{3}}\right)^{\frac{3}{2}}$ | <input type="checkbox"/> | $\sqrt[4]{13^3}$   |

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Rewrite each radical expression as an exponential expression.

- |               |                      |                 |                      |
|---------------|----------------------|-----------------|----------------------|
| $\sqrt{k}$    | <input type="text"/> | $\sqrt{k^3}$    | <input type="text"/> |
| $\sqrt[3]{k}$ | <input type="text"/> | $\sqrt[4]{k^2}$ | <input type="text"/> |

2. Rewrite the expression below as a radical.

$$\left(\frac{7}{22x}\right)^{\frac{2}{3}}$$

3. Select all of the expressions below that are equivalent to the expression  $\sqrt[3]{\frac{y^{13}}{216}}$ .

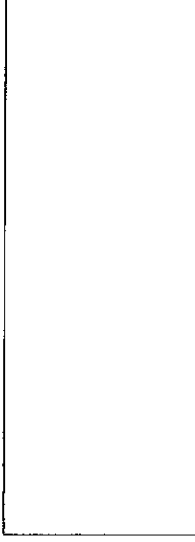
- |  |   |
|--|---|
| A. $\frac{y^3}{6}$                               | D. $\left(\frac{y^4\sqrt{y}}{6}\right)^{\frac{1}{3}}$ |
| B. $\frac{y^4\sqrt[3]{y}}{6}$                    | E. $6y^4\sqrt[3]{y}$                                  |
| C. $\left(\frac{y^{10}}{6}\right)^{\frac{1}{3}}$ | F. $\left(\frac{y^{13}}{216}\right)^{\frac{1}{3}}$    |



Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Write an algebraic proof to show whether the solution to the equation below is rational or irrational.

$$x + 2 = \sqrt{7}$$



4. Which expression is equivalent to  $\left(\frac{1080}{625}\right)^{\frac{1}{2}}$ ?

- A.  $\frac{25}{6\sqrt{30}}$   
 B.  $\frac{6\sqrt{30}}{25}$   
 C.  $\frac{36\sqrt{30}}{25}$   
 D.  $\frac{25}{36\sqrt{30}}$

5. Which of the following is equivalent to the expression  $\sqrt[3]{x^{12}}$ ?
- A.  $x^4$   
 B.  $x^{\frac{13}{12}}$   
 C.  $x^4$   
 D.  $x^{13}$

2. Is the product of  $\sqrt{2}$  and  $\sqrt{8}$  rational or irrational? Explain:


3. The rectangle shown below has a length of 6 feet.



The value of the area of the rectangle, in square feet, is an irrational number. The number that represents the width of the rectangle must be \_\_\_\_\_. Select the best answer to fill in the blank.

- A. A whole number.  
 B. A rational number.  
 C. An irrational number.  
 D. A non-real complex number





Algebra 1  
Secondary Education  
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4. Does either item below contradict the statement: "The sum of two rational numbers is a rational number?"

Item I:  $\frac{2}{5} + \frac{1}{3} = \frac{11}{15}$

Item II:  $\frac{1}{5} + \frac{4}{5} = 1$

- A. Neither Item I nor Item II contradicts the given statement.
- B. Both Item I and Item II contradict the given statement.
- C. Item I contradicts the statement. Item II is an example when the statement is true.
- D. Item II contradicts the statement. Item I is an example when the statement is true.

5. Select all of the following that are rational.

A.  $\sqrt{25} + \sqrt{9}$

B.  $\pi + \pi^2$

C.  $\pi + 2$

D.  $\sqrt{7} + 6$

E.  $\frac{\sqrt{45}}{\sqrt{5}}$

F.  $x + y$ , where  $x$  and  $y$  are irrational numbers

School District of Palm Beach County



Algebra 1  
Secondary Education  
MAFS.912.S-ID.1.1

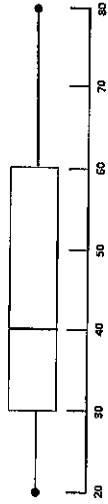
Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. The scores from Dr. Wilhelm's students' science fair projects are shown below. Make a histogram for the data.

100 95 88 62 76 90 100 58 72 60 85 90 70 72 54 100 60 80 75 51

If 70 is a passing score, what fraction of Dr. Wilhelm's students passed the assignment?

2. Fine Chocolates of the Palm Beaches used a box plot to show their daily sales for the month of December as shown below.



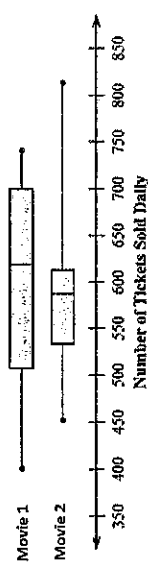
From the list below, fill in the following. The numbers may be used more than once or not at all.

- 20 30 40 50 60 70 80
- Median  Minimum  Range  IQR  Q1

School District of Palm Beach County

3. The local movie theater tracked the number of tickets sold for two movies each day for one week. The manager plotted the data on the box plots shown below.

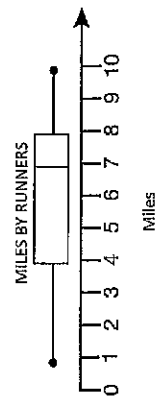
Tickets Sold for Two Movies



Based on the box plot, determine whether each of the following statements is True, False, or Cannot Be Determined from the information on the box plot.

	True	False	Cannot Be Determined
The mean number of tickets sold for Movie 1 is greater than the mean number of tickets sold for Movie 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The median number of tickets sold for Movie 1 is greater than the median number of tickets sold for Movie 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The interquartile range of the number of tickets sold for Movie 1 is greater than the interquartile range for the number of tickets sold for Movie 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Q3 for the number of tickets sold for Movie 1 is greater than the Q3 for the number of tickets sold for Movie 2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Twenty-eight runners were surveyed as to how many miles they ran each day. The box plot below was created from their responses.



If 14 runners ran between 4 and 8 miles, describe a possible number of runners below the first quartile.

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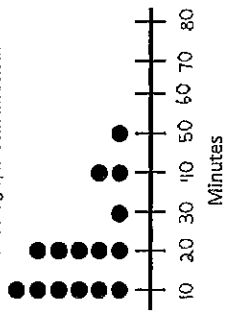
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5. Ms. Dowers asked her students how many minutes they studied for their math quiz last night. The students then marked a dot on the graph as shown below.

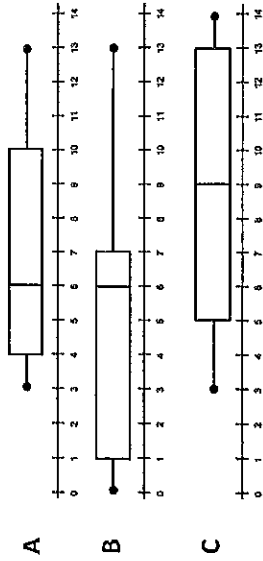


If one more student came to the board and put a dot on 30 minutes, explain if the median would increase, decrease, or stay the same.



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. A survey was taken of 6<sup>th</sup> grade (Group A), 7<sup>th</sup> grade (Group B) and 8<sup>th</sup> grade (Group C) students as to how many first cousins they have. The results are shown in the box plots below. Use these box plots to answer the questions.



What is the median for Plot C?

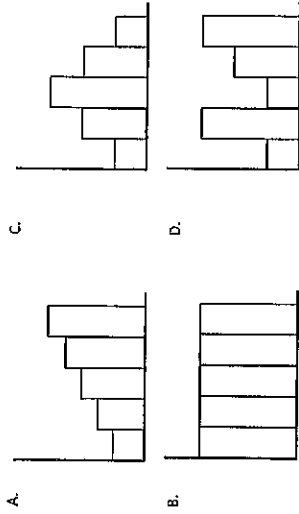
What is the difference in the interquartile range of Plot A and Plot B?

What is the range of Plot B?

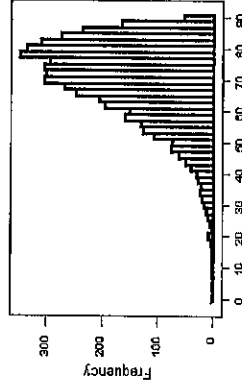
What percent of the 6<sup>th</sup> grade data is represented in the box in Plot A?



2. The heights of 100 people in an office building were recorded and the results were normally distributed. Which histogram shows a normal distribution that could represent this data?



3. The life span of males in Australia in 2012 is represented in the histogram below. Would this histogram be described as symmetric or skewed? Explain your answer.




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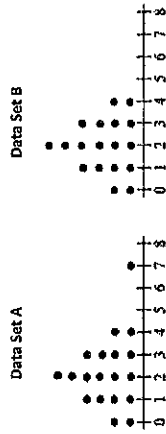
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Algebra 1  
Secondary Education  
MAFS.912.S-ID.1.2

4. The dot plots shown below represent the number of pets in a household of two neighboring streets.



Complete the table below using this data.

	Greater for Data Set A	Equal for Both Data Sets	Greater for Data Set B
Mean	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Median	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Range	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Below are the scores for two different sections of an Algebra test. Given that the distribution of scores follows a normal distribution, which section had a greater spread of data?

**Section 1:**

16	10	19	18	17	18	14	16	16	15
13	12	15	12	18	20	10	15	11	18

**Section 2:**

11	11	16	14	15	11	10	18	17	19
9	10	9	14	10	19	9	15	17	
12	10	12	11	14					

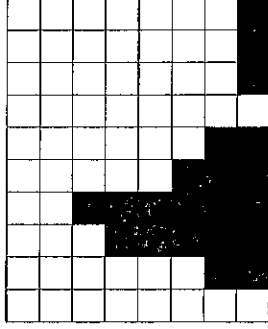
- A. Section 1 had a greater spread.  
 B. Section 2 had a greater spread.  
 C. Both sections had no spread.  
 D. Both sections had equal spread.



Algebra 1  
Secondary Education  
MAFS.912.S-ID.1.3

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. The Admiral Motor's CEO displayed the histogram below at a board of directors meeting. How can the shape of the data be described?



- A. Skewed Right  
 B. Skewed Left  
 C. Symmetric  
 D. Constant

2. Shula created a histogram showing the sales of hot dogs before and during each quarter of a football game. Explain why the histogram below is symmetric.






Algebra 1  
Secondary Education  
MAFS.912.S-ID.1.3

3. Ms. O'Brian showed her Algebra 1 class the results of their Chapter 5 test. The mean of the data set is 14 and the median is 10. What shape is the data?

- A. Constant
- B. Skewed Right
- C. Skewed Left
- D. Symmetric

4. The Western Boot Company tracks the number of men's boots sold each day. Given the data based on sales for 10 straight days: 18, 14, 12, 14, 11, 11, 19, 20, 16, and 11, which values would be considered outliers?

- A. Outliers must be less than 4 or greater than 24
- B. Outliers must be less than 11 or greater than 18
- C. Outliers must be less than 11 or greater than 20
- D. Outliers must be less than 0.5 or greater than 30.5

5. The frozen lemonade company Polar Cup uses data to show their sales for each day. Which of the following points, when added to the data set below, will create a data set that is skewed left?

25, 25, 26, 26, 27, 27, 28, 28, 29, 29

- A. 18
- B. 27
- C. 32
- D. 34

School District of Palm Beach County

School District of Palm Beach County



Algebra 1  
Secondary Education  
MAFS.912.S-ID.2.5

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Exactly half of the 180 students in Mr. Pete's classes are boys. During the Chapter 11 Algebra Test, 44 of his students scored 75% or more. There were 26 boys who scored 75% or higher.

Using the information above, complete the following table.

	Scored Less Than 75%	Scored At Least 75%	Total
Boys			
Girls			
Total			180

What percentage of students were girls scoring less than 75%?

2. At the Central Summer Camp, 150 children registered for the first session and 105 for the second session. The activities they chose in each session are shown in the two-way frequency table below.

	Swimming	Arts and Crafts
Session 1	71	79
Session 2	83	22

Which of the following represents the joint frequency of children registered in Session 2 who chose swimming?

- A. 0.2874
- B. 0.3255
- C. 0.4733
- D. 0.7905



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

3. A survey asked 247 students what their favorite subject was. Of those students, there were 115 boys. One hundred two students answered that their favorite subject was Social Studies, 50 of which were boys. Forty girls answered that their favorite subject was Math while 25 boys answered English. The marginal frequency of students answering science is 0.1214. The probability that a student who answered science was a girl is 0.667.

Use the numbers below to complete the two-way frequency table. Numbers may be used more than once or not at all.

5	10	15	20	25	30	45	52	60	65	70	100	110	115	132	247	362	400
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	Math	English	Science	Social Studies	TOTAL
Boys		25		50	
Girls	40				
Total				102	247

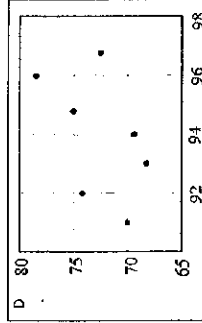
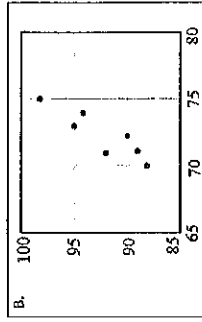
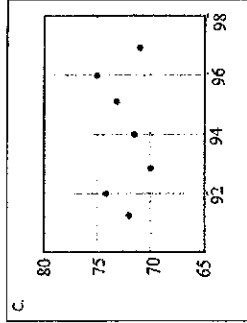
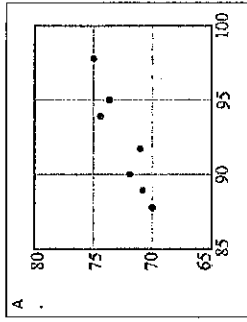
4. The Senior Class sponsor created the two-way frequency table shown below indicating student's choice for a homecoming theme.

	Casino	Masquerade Ball	Arabian Nights	Total
Juniors	100	212	50	362
Seniors	150	159	38	387
Total	290	371	88	749

Calculate the conditional relative frequency of juniors selecting a Masquerade Ball as the theme to homecoming to the nearest hundredth.

1. The air and water temperatures at the North County Aquatic Complex were recorded for one week as shown in the table below. Which is the correct scatter plot showing the dependence of water temperature on air temperature?

Air Temperature (in °F)	Water Temperature (in °F)
90	72
94	74
88	70
89	71
95	73
98	75
92	71



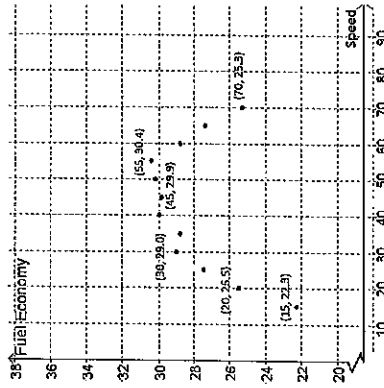


Algebra 1  
Secondary Education  
MAFS.912.S-ID.2.6

2. Using the information in Question 1, which of the following could represent the line of best fit for the data?

- A.  $y = -\frac{5}{7}x + 6$
- B.  $y = \frac{3}{7}x + 32$
- C.  $y = 2x - 52$
- D.  $y = 93x + 73$

3. A study was conducted to find how the average speed of a car in miles per hour compares to the car's fuel economy in miles per gallon. The scatter plot below is a display of those results. A quadratic regression was then performed on the data to determine the best-fitting model as  $y = -0.00823x^2 + 0.747x + 13.4$ . What is the residual for the speed of 55 mph?





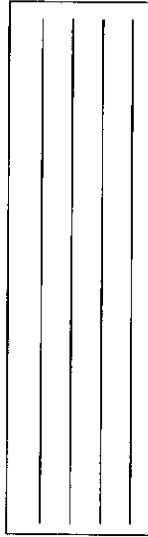
Algebra 1  
Secondary Education  
MAFS.912.S-ID.2.6

4. A scatter plot was created based on the number of hours,  $x$ , students studied for their mathematics test and the score,  $y$ , they receive on that test. A linear regression was performed on the data and the resulting equation was  $y = 50 + 10.5x$ . Using this, what is the minimum number of hours a student should study in order to score an A ( $\geq 90$ ) on the test?

- A. 2
- B. 3
- C. 4
- D. 5

5. The data set below shows the temperature, in degrees Fahrenheit, of a mug of tea compared to the time in minutes after being poured out of the tea kettle. An exponential regression was performed on this data to obtain the model  $y = 174.4(0.987)^x$ . Create a residual plot and explain why the model is or is not a good fit for this data.

Time (min)	Temp (°F)
5	168.5
8	158.2
11	149.1
15	141.2
18	134.6
22	125.3
25	123.4
29	116.1
32	114.4
35	113.2





Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Larry recorded the cost of enrollment and weekly tuition at summer camps in his state. He wrote a linear equation to estimate the total cost, based upon the number of weeks spent at camp and the cost of enrollment:  $y = 58x + 123$ . Identify the slope and y-intercept for this equation, and interpret the meaning of each in the context of the information presented.

Slope:

y-intercept:

2. Gina charges an hourly rate plus a one-time setup fee for each home she decorates. The linear equation below can be used to determine the total she charges each customer.

$$y = 75x + 250$$

Identify the slope and intercept for the equation above and interpret the meaning of each in the context of the information presented.

Slope:

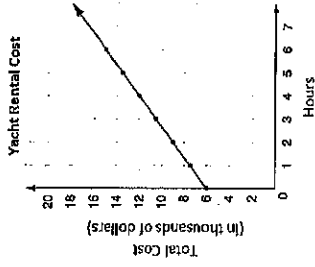
y-intercept:



3. Tirado hired a Belle Glade company to perform regular maintenance on his boats. The amount Tirado pays can be modeled by the equation  $y = 50x + 1850$ , where  $y$  represents the total cost and  $x$  represents the number of boats serviced. Which of the following is the correct interpretation of the slope in the context of this problem?

- A. The discount Tirado earns for each boat serviced.
- B. The amount Tirado pays for each boat serviced.
- C. The number of boats Tirado has.
- D. The one-time fee Tirado pays for the service.

4. A Pahokee yacht rental service charges its customers the same amount for each hour they rent a yacht, plus a monthly subscription fee. The graph below models the total monthly cost for using the service. Which of the following shows the hourly rental rate and subscription fee for the yacht rental service?

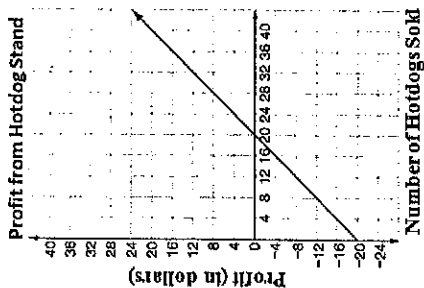


- A. Hourly Rate: \$1,500 per hour  
Subscription Fee: \$6,000
- B. Hourly Rate: \$1,500 per hour  
Subscription Fee: \$7,500
- C. Hourly Rate: \$6,000 per hour  
Subscription Fee: \$1,500
- D. Hourly Rate: \$6,000  
Subscription Fee: \$7,500





5. The graph below shows the relationship between the number of hotdogs sold at a hotdog stand and the profit in dollars.



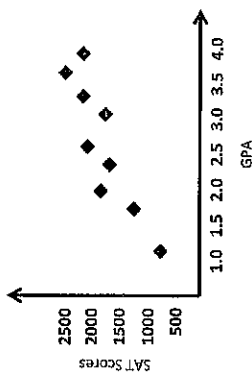
Which of the following best describes the y-intercept of the graph above?

- A. the cost of supplies for the stand
- B. the price of each hotdog
- C. number of cups sold before the first hour
- D. the amount earned after the first hotdog was sold



Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. The following scatter plot shows students' GPA and SAT scores. Based on the scatter plot, which of the following is the best assumption about the correlation between the variables?



- A. Positive linear correlation
- B. No correlation
- C. Negative linear correlation
- D. Exponential correlations

2. A study found an association between gestational age and birth weight with a correlation coefficient of 0.9. Explain whether this correlation coefficient would be considered strong and positive or weak and positive.

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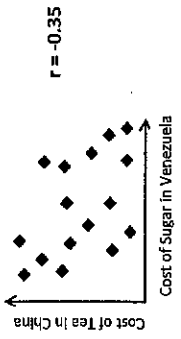
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3. A college student's research project found that student ACT scores and grade point averages (GPAs) have a linear association with a correlation coefficient of 0.8. What does the value of this correlation coefficient suggest?

- A. ACT scores decrease as GPA increases
- B. There is no relation between ACT scores and GPA
- C. GPA increases as ACT scores decrease
- D. ACT scores increase as GPA increases

4. Which of the following is true about the data represented below?



- A. The correlation is greater than zero
- B. The data shows a weak negative correlation
- C. The data shows a strong negative correlation
- D. The data shows a strong positive correlation

5. Which of the following values for the correlation coefficient would show a strong negative correlation between the temperature in degrees Fahrenheit and coat sales?

- A. -0.2
- B. 0.95
- C. -0.85
- D. 0.0



Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. What does an  $r$  value of  $-0.89$  suggest about two variables?

- A. As the independent variable increases, the dependent variable increases.
- B. As the independent variable increases, the dependent variable decreases.
- C. As the independent variable increases, the dependent variable constant.
- D. As the independent variable decreases, the dependent variable constant.

2. Four students each conducted different studies comparing two variables. Each student calculated the correlation coefficient,  $r$ , for their variables. Which  $r$  value suggests the strongest linear relationship?

- A.  $r = -0.7$
- B.  $r = -0.3$
- C.  $r = 0$
- D.  $r = 0.6$

3. James is learning about causal relationships. He studied four pairs of variables. Which pair of variables,  $x$  and  $y$ , have a causal relationship?

- A.  $x$  = number of rainy days in September,  $y$  = amount of water consumed in September
- B.  $x$  = number of hours spent studying,  $y$  = test average
- C.  $x$  = number of in-class assignments,  $y$  = amount of free time after school
- D.  $x$  = number of school days in a year,  $y$  = number of rainy days in a year

4. Which of the following values for  $r$  suggest that there is no linear correlation?

- A.  $-1.0$
- B.  $0$
- C.  $0.85$
- D.  $1.0$

5. Which of the following values for  $r$  suggests the strongest linear correlation?

- A.  $-0.13$
- B.  $0.1$
- C.  $0.61$
- D.  $-0.92$