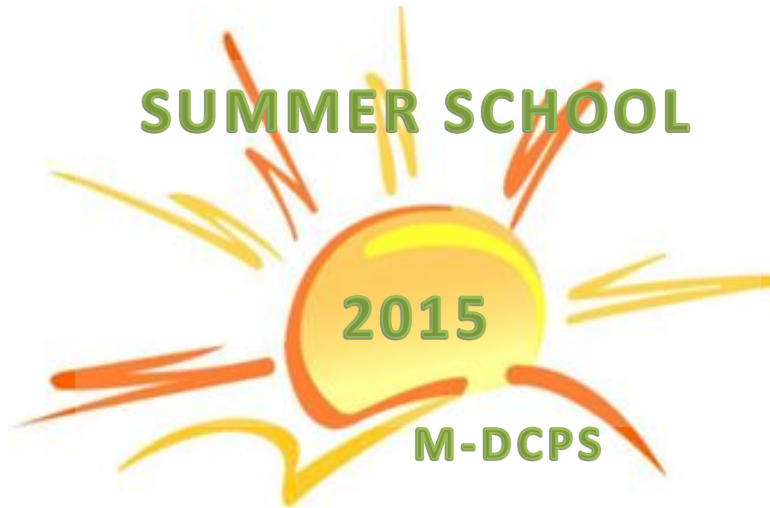


SUMMER SCHOOL



MAFS Algebra 1

FSA EOC Review

Day 20 - Teacher Packet

Day 20: FSA EOC Review

MAFS.912.F-IF.1.2

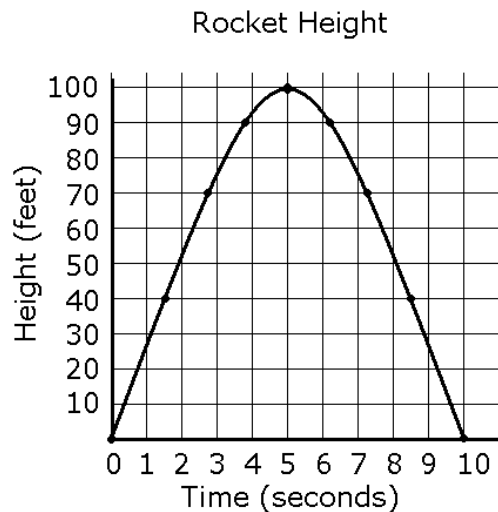
1. The cost to manufacture x pairs of sunglasses can be represented by a function $C(x)$. If it costs \$398 to manufacture 4 pairs of sunglasses, which of the following is true?

Select the correct equation.

- A. $C(4) = 99.50$ B. $C(4) = 398$
C. $C(398) = 4$ D. $C(99.50) = 1$

MAFS.912.F-IF.2.4

2. The graph shows the height of a rocket over ten seconds. Which situation is best represented by the graph?



- A. Three seconds after take-off, the rocket was at a height of 70 feet. At 5 seconds, the rocket reached its greatest height of 110 feet. Ten seconds after take-off, it hit the ground.
- B. Three seconds after take-off, the rocket was at a height of 75 feet. At 5 seconds, the rocket reached its greatest height of 100 feet. Ten seconds after take-off, it hit the ground.
- C. Two seconds after take-off, the rocket was at a height of 75 feet. At 5 seconds, the rocket reached its greatest height of 100 feet. Five seconds after take-off, it hit the ground.
- D. One second after take-off, the rocket was at a height of 50 feet. At 5 seconds, the rocket reached its greatest height of 100 feet. Five seconds after take-off, it hit the ground.

MAFS.912.F-BF.1.1

3. Caitlin has a movie rental card worth \$175. After she rents the first movie, the card's value is \$172.25. After she rents the second movie, its value is \$169.50. After she rents the third movie, the card worth is \$166.75.

Assuming the pattern continues, write an expression to define $A(n)$, the amount of money on the rental card after n rentals.

$$A(n) = 175 - 2.75n$$

- a. Caitlin rents a movie every Friday night. How many weeks in a row can she afford to rent a movie, using her rental card only? Explain how you arrived at your answer.
Caitlin can rent a movie each week for 63 weeks since she will not have enough money on the rental card to rent a movie for the 64th week

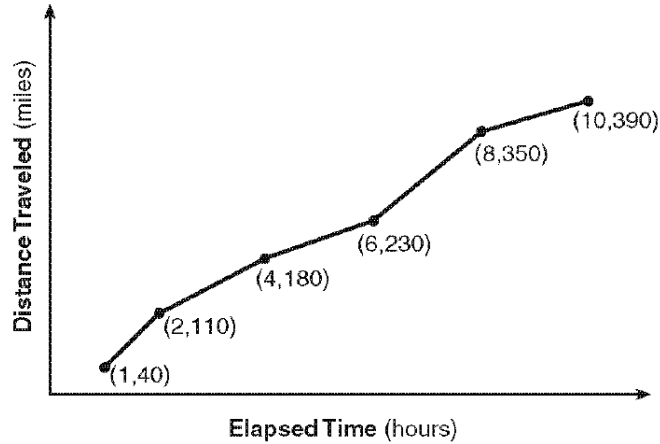
MAFS.912.F-BF.2.3

4. The vertex of the parabola represented by $f(x) = x^2 - 4x + 3$ has coordinates $(2, -1)$. Find the coordinates of the vertex of the parabola defined by $g(x) = f(x - 2)$. Explain how you arrived at your answer.

The correct answer may be found algebraically by substituting the expression $(x - 2)$ for x into the expression for $f(x)$ and examining its graph: $f(x - 2) = (x - 2)^2 - 4(x - 2) + 3$. The new vertex is $(4, -1)$.

MAFS.912.F-IF.2.6

5. The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.

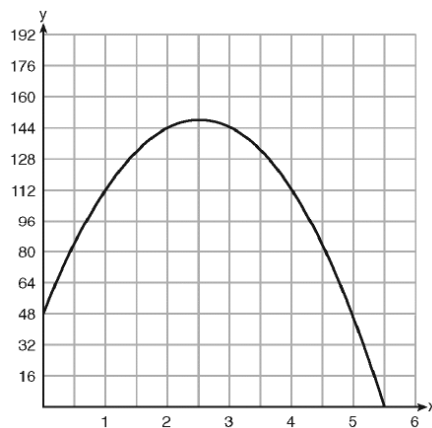


During which interval was their average speed the greatest?

- A. the first hour to the second hour
- B. the second hour to the fourth hour
- C. the sixth hour to the eighth hour
- D. the eighth hour to the tenth hour

MAFS.912.F-IF.2.4

6. A ball is thrown into the air from the edge of a 48-foot-high cliff so that it eventually lands on the ground. The graph below shows the height, y , of the ball from the ground after x seconds.



For which interval is the ball's height always *decreasing*?

- A. $0 \leq x \leq 2.5$
- B. $2.5 < x < 5.5$
- C. $0 < x < 5.5$
- D. $x \geq 2$

MAFS.912.F-IF.2.5

7. Officials in a town use a function, C , to analyze traffic patterns. $C(n)$ represents the rate of traffic through an intersection where n is the number of observed vehicles in a specified time interval. What would be the most appropriate domain for the function?

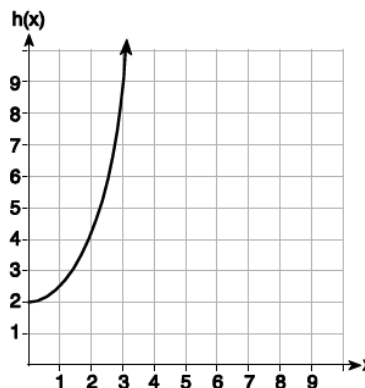
- A. $\{\dots - 2, -1, 0, 1, 2, 3, \dots\}$
B. $\{\dots 0 \frac{1}{2}, 1, 1 \frac{1}{2}, 2, 2 \frac{1}{2}\}$
C. $\{-2, -1, 0, 1, 2, 3\}$
D. $\{0, 1, 2, 3, \dots\}$

MAFS.912.F-IF.2.6

8. Given the functions $g(x)$, $f(x)$, and $h(x)$ shown below:

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

x	$f(x)$
0	1
1	2
2	5
3	7



The correct list of functions ordered from greatest to least by average rate of change over the interval $0 \leq x \leq 3$ is:

- A. $f(x), g(x), h(x)$
B. $h(x), g(x), f(x)$
C. $g(x), f(x), h(x)$
D. $h(x), f(x), g(x)$

MAFS.912.A-APR.1.1

9. An expression is shown.

$$-3a(a + b - 5) + 4(-2a + 2b) + b(a + 3b - 7)$$

Which expression is equivalent to the expression shown?

- A. $-11a^2 + 3b^2 - 2ab + 7a + b$
B. $-11a^2 + 3b^2 - 4ab + 7a + b$
C. $-3a^2 + 3b^2 - 2ab + 7a + b$
D. $-3a^2 + 3b^2 - 4ab + 7a + b$

MAFS.912.A.CED.1.1

10. The length of the shortest side of a right triangle is 8 inches. The lengths of the other two sides are represented by consecutive odd integers. Which equation could be used to find the lengths of the other sides of the triangle?

- A. $8^2 + (x + 1) = x^2$
B. $x^2 + 8^2 = (x + 1)^2$
C. $8^2 + (x + 2) = x^2$
D. $x^2 + 8^2 = (x + 2)^2$

MAFS.912.F-IF.3.8a

11. Consider the function $f(x) = 2x^2 + 4x - 30$. Classify each statement

Statement	True	False
The vertex of the graph of $f(x)$ is $(1, -32)$.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The zeros of $f(x)$ are $x = 3$ and $x = -5$.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The graph of $f(x)$ opens down.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The axis of symmetry is $x = -1$.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The y-intercept of $f(x)$ is -30 .	<input checked="" type="checkbox"/>	<input type="checkbox"/>

MAFS.912.A-REI.2.3

12. Which of the following inequalities have solution sets that only include positive numbers?

- $3g - 7 < -2g + 3$
- $-5h + 1 < -2h - 17$
- $8 < -2k + 12$
- $7m + 15 < 8m + 12$
- $2n + 7 - 6n < -10n - 11 + 3n$

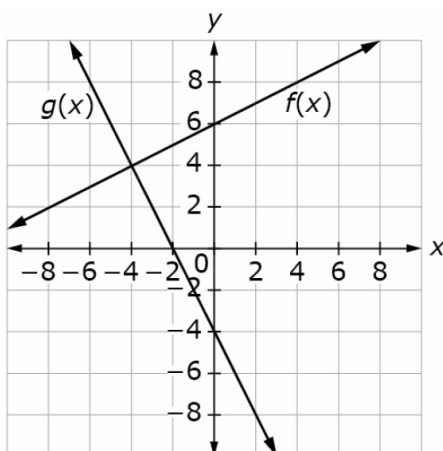
MAFS.912.A-CED.1.4

13. Which of the following operations will solve Ohm's law, $V = IR$, for I ?

- A. Subtract R from both sides.
- B. Divide both sides by R .
- C. Subtract V from both sides.
- D. Divide both sides by I .

MAFS.912.A-REI.4.11

14. This graph shows linear equations $y=f(x)$ and $y=g(x)$. Enter the solution to the equation $f(x)-g(x)=0$.



MAFS.912.A-REI.3.5

15. The solution to the system of equations $x + y = 1$ and $x - y = -7$ is $(-3, 4)$. This solution is NOT a solution to which of the following equations?

- $x + y - 2(x - y) = 1 - 2(-7)$
- $3(x + y) + x - y = 3(1) - 7$
- $x + y + 5(x - y) = 5(1) - 7$
- $-4(x + y) + x - y = 1 - 4(-7)$
- $x + y - x + y = 1 + 7$

MAFS.912.A-SSE.1.1b

16. Which of the following scenarios give reasonable interpretations of $(1 + 0.05)^t$ in the expression $250(1 + 0.05)^t$?

- Marisa deposits \$250 into a bank account that pays 5% interest compounded annually. After t years, she will have $(1 + 0.05)^t$ dollars in the account.
- A snake is 250 mm long. It increases in length by 5% every week. After t weeks the snake will be $(1 + 0.05)^t$ times longer.
- A cell culture has 250 cells, and the population of cells grows at a rate of 5% per day. There were $(1 + 0.05)^t$ cells when the culture first started to grow.
- A sinkhole is 250 feet deep. Every year, it becomes 5% deeper. After t years, the sinkhole is $(1 + 0.05)^t$ feet deeper.
- An empty water tank is partially filled with 250 gallons, and the volume of water in the tank increases by 5% each month afterward. After t months, the number of gallons will be increased by a factor of $(1 + 0.05)^t$.

MAFS.912.A-REI.3.6

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

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

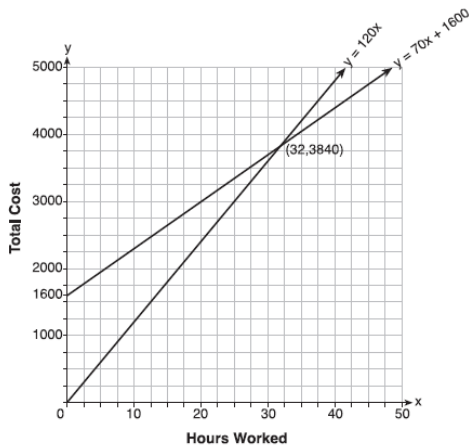
$$\begin{cases} y = 120x \\ y = 70x + 1600 \end{cases}$$

b. Determine and state the number of hours that must be worked for the cost of each company to be the same.

32 hours

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

Green Thumb Landscapers



MAFS.912.A-REI.3.6

18. Which of the following systems of equations has a solution in which the x -value is greater than the y -value?

$\begin{cases} x - 3y = 1 \\ 5x + 4y = 6 \end{cases}$

$\begin{cases} 3x + 2y = -19 \\ -2x - 3y = 21 \end{cases}$

$\begin{cases} 6x - y = -10 \\ -2x - 2y = -6 \end{cases}$

$\begin{cases} 3x + 5y = 16 \\ 4x - y = 6 \end{cases}$

$\begin{cases} 5x - 2y = 12 \\ -10x + 4y = -20 \end{cases}$

MAFS.912.A-SSE.1.1a

19. A bacteria culture starts with three cells. Each cell in this culture doubles every hour. After t hours, the number of cells in the culture can be written as $3(2)^t$. Interpret the meaning of 2^t in this context.

- A. The factor 2^t is the initial number of cells.
- B. The factor 2^t is the number of hours.
- C. The factor 2^t is the number of cells in the culture after t hours.
- D. The factor 2^t is the number of cells that each original cell in the culture has produced after t hours.**

MAFS.912.A-REI.2.4a

20. Which of the following equations, when rewritten in the form $(x - p)^2 = q$, have a value of q that is a perfect square?

$x^2 - 2x + 5 = 13$

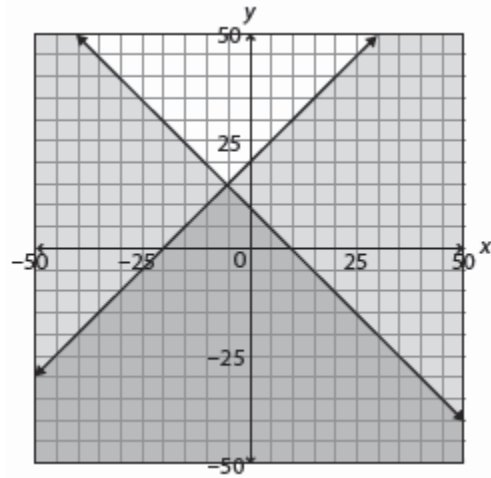
$x^2 + 8x + 9 = 5$

$2x^2 + 12x - 29 = 81$

$5x^2 - 20x + 14 = -6$

$3x^2 + 36x + 88 = 4$

21. Which system of inequalities represents the graph?



A. $\begin{cases} -x - y \leq 10 \\ x + y \geq 20 \end{cases}$

C. $\begin{cases} x + y > 10 \\ -x + y \geq 20 \end{cases}$

B. $\begin{cases} x + y \leq 10 \\ -x + y \geq 20 \end{cases}$

D. $\begin{cases} x + y \leq 10 \\ -x + y \leq 20 \end{cases}$

MAFS.912.A-CED.1.3

22. Sheila is organizing desks in her classroom in preparation for a class of at least 25 students. She wants the desks to be arranged in a rectangle. Due to the dimensions of her classroom, she cannot reasonably fit more than 6 desks in any row or 7 desks in any column. When trying to figure out how Sheila can arrange her room, which of the following is not a meaningful criterion in terms of the number of rows of desks r and the number of columns of desks c ?

- A. $r \leq 6$
- B. $c \leq 7$
- C. $r + c \geq 25$
- D. $rc \geq 25$

MAFS.912.A-REI.1.1

23. What two properties are used in the following

solution to $4b - 3 = 17$?

$$\begin{aligned}4b - 3 &= 17 \\4b - 3 + 3 &= 17 + 3 \\4b &= 20 \\ \frac{4b}{4} &= \frac{20}{4} \\b &= 5\end{aligned}$$

- A. Addition Property of Equality and Division Property of Equality
- B. Subtraction Property of Equality and Addition Property of Equality
- C. Multiplication Property of Equality and Distributive Property
- D. Subtraction Property of Equality and Zero Product Property

MAFS.912.A-REI.1.1

24. Determine which of the following properties are used in the given solution to: $x^2 - 2(2x + 9) = 2x - 2$

$$\begin{aligned}x^2 - 2(2x + 9) &= 2x - 2 \\x^2 - 4x - 18 &= 2x - 2 \\x^2 - 4x - 18 + 2 &= 2x - 2 + 2 \\x^2 - 4x - 16 &= 2x \\x^2 - 4x - 16 - 2x &= 2x - 2x \\x^2 - 6x - 16 &= 0 \\(x - 8)(x + 2) &= 0 \\x - 8 = 0 \text{ or } x + 2 &= 0 \\x - 8 + 8 = 0 + 8 \text{ or } x + 2 - 2 &= 0 - 2 \\x = 8 \qquad \qquad \qquad x &= -2\end{aligned}$$

- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Distributive Property
- Zero Product Property

MAFS.912.A-REI.2.4b

25. Which of the following quadratic equations have two distinct, real solutions?

- $x^2 = 36$
- $x^2 - 78 = 0$
- $x^2 - 8x + 16 = 0$
- $3x^2 - 6x = 29$
- $5x^2 - 4x + 3 = 0$

MAFS.912.A-REI.4.11

26. Complete the table of values below.

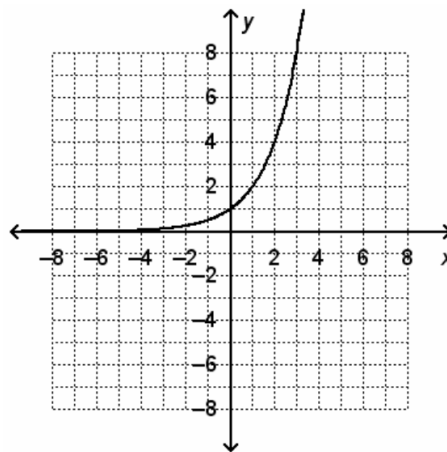
x	$4x + 8$	$7x - 11$
5	28	24
5.5	30	27.5
6	32	31
6.5	34	34.5
7	36	38
7.5	38	41.5

- a. Use the table to determine an approximate solution of $4x + 8 = 7x - 11$. Justify why your solution is the best approximation given in the table.

The approximate solution is $x = 6.5$. This solution is the best approximation because the difference between $4x + 8$ and $7x - 11$ is the smallest at $x = 6.5$.

MAFS.912.A-REI.4.10

27. Which of the following are solutions of the equation represented by the graph?



- $(-4, 1)$
- $(1, 0)$
- $(-1, 2)$
- $(2, 4)$
- $(0, 1)$
- $(3, 8)$

MAFS.912.A-SSE.2.3a

28. Identify which of the following functions have at least one zero greater than 4.

$w(c) = c^2 + 11c + 30$

$f(x) = x^2 - 5x - 14$

$g(x) = x^2 + 5x - 24$

$v(a) = a^2 - 5a + 6$

$s(t) = t^2 - 3t - 54$

$h(x) = x^2 - 2x - 24$

MAFS.912.A-SSE.1.1a

29. A painter working high on the side of a skyscraper drops his brush from his scaffolding, which is hanging 1024 feet above the ground. The height above the ground of the brush can be modeled by the equation $h = -16t^2 + 1024$, where t is the number of seconds after the brush is dropped and h is the height in feet. Interpret the meaning of $-16t^2$ in this context.

- A. The term $-16t^2$ represents the time the brush takes to hit the ground.
- B. The term $-16t^2$ represents the initial height of the brush.
- C. The term $-16t^2$ represents the height of the brush after t seconds.
- D. The term $-16t^2$ represents the distance the brush falls in t seconds.

MAFS.912.A-SSE.1.2

30. Which of the following statements present(s) valid reasoning?

$x^6 + 81$ can be rewritten as $(x^2)^3 + (3)^3$ and factored as a sum of two cubes.

$49c^2 - 154c + 121$ can be rewritten as $(7c)^2 - 2(7c)(11) + 11^2$ and factored as a perfect square trinomial.

$36p^4 + 96p + 64$ can be rewritten as $(6p^2)^2 + 2(6p^2)(8) + 8^2$ and factored as a perfect square trinomial.

$x^4 + 16$ can be rewritten as $(x^2)^2 - (-4)^2$ and factored as a difference of squares.

$x^{18} - 8$ can be rewritten as $(x^6)^3 - 2^3$ and factored as a difference of cubes.

$x^9 + 64$ cannot be factored as the sum of two cubes because x^9 is a perfect cube and 64 is a perfect square.

MAFS.912.F-BF.2.3

31. $f(x) = -x + 3$ and $g(x) = -x - 2$. If $g(x)$ can be written as $f(x) + k$, what is the value of k ?

A. -5

B. -1

C. 1

D. 5

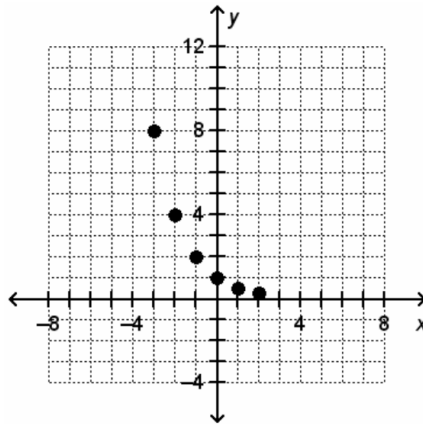
MAFS.912.F-IF.1.2

32. If $f(x) = 2x + 5$, what is $f(x + 1)$?

- A. undefined
- B. $2(x + 1) + 5$
- C. $2x + 6$
- D. $2(x + 1) - 5$

MAFS.912.F-IF.1.1

33. What are the domain and range of the function $y = f(x)$ as shown on the graph?



- A. The domain is $\{0.25, 0.5, 1, 2, 4, 8\}$, and the range is $\{-3, -2, -1, 0, 1, 2\}$.
- B. The domain is $\{-3, -2, -1, 0, 1, 2\}$ and the range is $\{0.25, 0.5, 1, 2, 4, 8\}$.
- C. The domain is all real numbers between -3 and 2 , and the range is all real numbers between 0.25 and 8 .
- D. The domain is all real numbers between 0.25 and 8 , and the range is all real numbers between -3 and 2 .

MAFS.912.F-LE.1.1a

34. For some exponential function $f(x)$, $f(0) = 12$, $f(1) = 18$, and $f(2) = 27$. How does $f(x)$ change when x increases by 1?

- A. $f(x)$ grows by a factor of $\frac{2}{3}$
- B. $f(x)$ grows by a factor of $\frac{3}{2}$
- C. $f(x)$ increases by 6.
- D. $f(x)$ increases by 9.

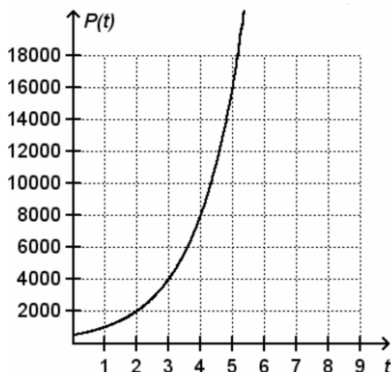
MAFS.912.F-BF.1.1a

35. A diver jumps off a 10-meter-high diving board with an initial vertical velocity of 3 meters per second. The function $h(t) = -4.9t^2 + v_0t + h_0$ models the height of a falling object, where v_0 is the initial vertical velocity and h_0 is the initial height. Which function models the diver's height h , in meters, above the water at time t , in seconds?

- A. $h(t) = -4.9t^2 - 3t + 10$
- B. $h(t) = -4.9t^2 - 3t - 10$
- C. $h(t) = -4.9t^2 + 3t + 10$
- D. $h(t) = -4.9t^2 + 3t - 10$

MAFS.912.F-IF.2.5

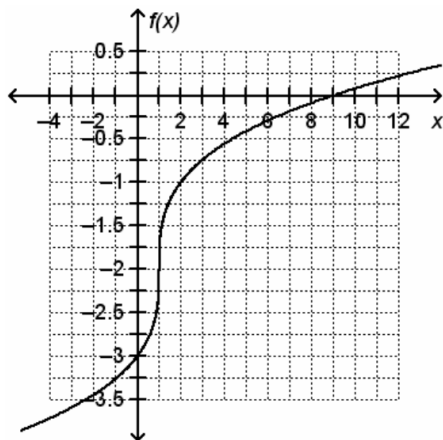
36. The growth of a population of bacteria can be modeled by an exponential function. The graph models the population of the bacteria colony $P(t)$ as a function of the time t , in weeks, that has passed. The initial population of the bacteria colony was 500. What is the domain of the function? What does the domain represent in this context?



- A. The domain is the real numbers greater than 500. The domain represents the time, in weeks, that has passed.
- B. The domain is the real numbers greater than 500. The domain represents the population of the colony after a given number of weeks.
- C. The domain is the nonnegative real numbers. The domain represents the time, in weeks, that has passed.
- D. The domain is the nonnegative real numbers. The domain represents the population of the colony after a given number of weeks.

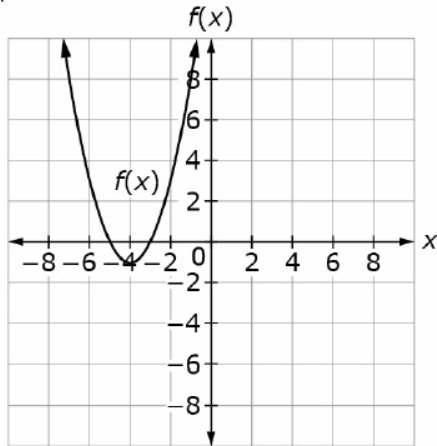
MAFS.912.F-IF.2.4

37. Choose all the statements that are true about the graph.



- The x -intercept is 9.
- The y -intercept is -2 .
- $f(x)$ is increasing when $x < 1$.
- $f(x)$ is decreasing when $x > 1$.
- $f(x)$ has a local maximum at $(1, -2)$.
- $f(x)$ has a local minimum at $(1, -2)$.
- $f(x)$ is negative when $x < 9$.
- $f(x)$ is positive when $x > -2$.

38. The graph represents $f(x)$ and the table shows some values of another quadratic function $g(x)$.



x	-4	-3	-2	-1	0	1	2	3	4	5	6
$g(x)$	0	-9	-16	-21	-24	-25	-24	-21	-16	-9	0

Select whether each statement is True or False about the given functions.

<i>Statement</i>	<i>True</i>	<i>False</i>
The minimum x value of $f(x)$ is greater than the minimum x value of $g(x)$.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The value of x when $f(x)$ is at its minimum is less than the value of x when $g(x)$ is at its minimum.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Both x intercepts of $g(x)$ occur when x is greater than zero.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The line of symmetry of $f(x)$ is $x = 1$.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

39. A person's body mass index (BMI) is calculated by dividing the person's mass in kilograms by the person's height in meters. The table shows the median BMI for U.S. males from age 2 to age 12. For which intervals is the average rate of change in the BMI positive?

<i>Age (years)</i>	<i>Median BMI</i>
2	16.575
4	15.641
6	15.367
8	15.769
10	16.625
12	17.788

- age 2 to age 4
- age 4 to age 6
- age 6 to age 8
- age 8 to age 10
- age 10 to age 12

MAFS.912.S-ID.3.7

40. The linear equation $p = 2376t + 73,219$ estimates the number of college seniors p who graduated with a bachelor's degree in psychology t years after 2000. The linear equation $b = 2,376t + 56,545$ models the number of college seniors b who graduated with a bachelor's degree in biology t years after 2000. Classify each statement.

<i>Statement</i>	<i>True</i>	<i>False</i>
The number of psychology degrees increases by about 73,219 each year.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The number of biology degrees increases by about 2376 each year.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
About 73,000 students graduated with degrees in psychology in 2000.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
About 57 students graduated with degrees in biology in 2000.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
In 2000, more students graduated with psychology degrees than biology degrees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

MAFS.912.A-SSE.2.3b

41. Determine which functions have a minimum value that is greater than zero.

- $f(x) = x^2 - 6x + 5$
- $f(x) = x^2 + 4x + 7$
- $f(t) = t^2 + 8t - 10$
- $f(n) = n^2 + 10n + 11$
- $f(p) = p^2 - 2p + 8$

MAFS.912.F-IF.3.8a

42. Which of the following statements correctly describe the graph of $f(x) = 2x^2 + 8x - 2$?

- The maximum value of the function is 10.
- The minimum value of the function is -10.
- The axis of symmetry is the line $x = -2$.
- The axis of symmetry is the line $x = 2$.
- The graph is a parabola that opens up.
- The graph is a parabola that opens down.

MAFS.912.F-LE.1.1b

43. In which of the following situations does Michael's salary change at a constant rate relative to the year?

- A. Michael's starting salary is \$9500 and increases by 4% each year.
- B. Michael's starting salary is \$9500 and increases by \$500 each year.
- C. Michael's starting salary is \$9500. He receives a \$500 raise after one year and a \$600 raise after the second year.
- D. Michael's starting salary is \$9500. He receives a 4% raise after one year and a 5% raise after the second year.

MAFS.912.F-IF.3.8b

44. Which of these functions describe exponential growth?

- $f(t) = 1.25^t$
- $f(t) = 2(0.93)^{0.5t}$
- $f(t) = 3(1.07)^{3t}$
- $f(t) = 18(0.85)^t$
- $f(t) = 0.5(1.05)^t$
- $f(t) = 3(1.71)^{5t}$
- $f(t) = 0.68^{2t}$
- $f(t) = 8(1.56)^{1.4t}$

MAFS.912.F-IF.3.8b

45. Determine if each function below is equivalent to $f(t) = 0.25^t$.

	<i>Equivalent</i>	<i>Not Equivalent</i>
$f(t) = 1^{\frac{t}{4}}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$f(t) = 0.5^{2t}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$f(t) = 0.0625^{\frac{t}{2}}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$f(t) = 0.125^{\frac{t}{2}}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$f(t) = 4^{-t}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$f(t) = -0.25^{-t}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>

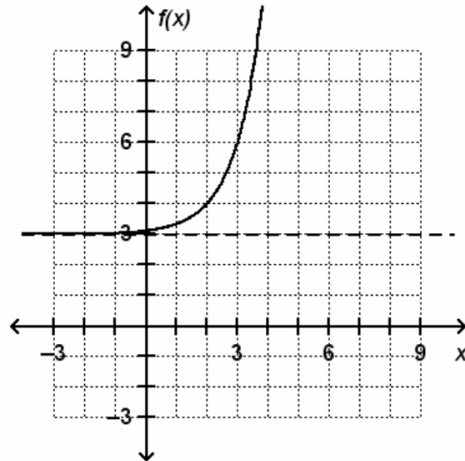
MAFS.912.A-APR.2.3

46. Which of the following polynomial functions have graphs that intersect the horizontal axis at least twice?

- $f(x) = x^2 + 10x + 9$
- $f(x) = x^2 - 10x + 25$
- $f(x) = x^2 - 81$
- $f(x) = (x - 1)(x^2 + 9x + 20)$
- $f(x) = (x - 4)(x^2 - 8x + 16)$
- $f(x) = (x + 2)(x^2 - 4x + 4)$

MAFS.912.F-IF.3.7

47. The exponential function $f(x)$ has a horizontal asymptote at $y = 3$. What is the end behavior of $f(x)$?



- A. As x decreases without bound, $f(x)$ decreases without bound. As x increases without bound, $f(x)$ increases without bound.
- B. As x decreases without bound, $f(x)$ increases without bound. As x increases without bound, $f(x)$ decreases without bound.
- C. As x decreases without bound, $f(x)$ approaches, but never reaches, 3. As x increases without bound, $f(x)$ increases without bound.
- D. As x decreases without bound, $f(x)$ decreases without bound. As x increases without bound, $f(x)$ approaches, but never reaches, 4.

MAFS.912.F-LE.1.1c

48. Which of the following situations describe a quantity that increases by a constant percent that is at least 20% per unit time?

- There are 400 bacteria in a Petri dish the first day, 700 the second day, 1225 the third day, and so forth.
- The number of fish in the lake is 24 the first year, 48 in the second year, 72 in the third year, and so on.
- The number of visitors for a website is 4000 one month, 5200 the second month, 6760 the third month, and so on.
- The price for a gallon of cooking oil is \$3.00 the first year, \$3.30 the second year, \$3.63 the third year, and so on.
- The population of a town is 10,000 the first year, 11,500 the second year, 13,225 the third year, and so on.

MAFS.912.F-LE.2.5

49. The function $a(t) = 44,000(1.045)^t$ models Johanna's annual earnings a , in dollars, t years after she starts her job. Which of the following statements are true about Johanna's salary?

- Johanna initially earns \$44,000 per year.
- Johanna initially earns \$45,980 per year.
- Johanna's salary increases by 1.045% per year.
- Johanna's salary increases by 4.5% per year.
- Johanna's salary increases by 104.5% per year.

MAFS.912.F-LE.1.2

50. Emile is saving money to buy a bicycle. The amount he has saved is shown in the table. Which of the functions below describe the amount A , in dollars, Emile has saved after t weeks?

<i>Weeks</i>	<i>Amount</i>
1	\$30
2	\$45
3	\$60
4	\$75
5	\$90
6	\$105

$A(t) = 15 + 15(t - 1)$

$A(t) = 30 + 15(t - 1)$

$A(t) = 15 + 15t$

$A(t) = 30 + 15t$

$A(t) = 30(1.5)^t$

$A(t) = 15(2)^t$

MAFS.912.F-BF.1.1b

51. Two identical water tanks each hold 10,000 liters. Tank A starts full, but water is leaking out at a rate of 10 liters per minute. Tank B starts empty and is filled at a rate of 13 liters per minute. Which functions correctly describe the combined volume V of both tanks after t minutes?

$V(t) = 10,000 - 10t + 13t$

$V(t) = 10,000 - 10t - 13t$

$V(t) = 10,000 + 10t - 13t$

$V(t) = 10,000 - 3t$

$V(t) = 10,000 + 3t$

$V(t) = 10,000 - 23t$

MAFS.912.F-IF.1.3

52. Which function below generates the sequence $-2, 0, 2, 4, 6, \dots$?

A. $f(n) = n - 2$, where $n \geq 0$ and n is an integer.

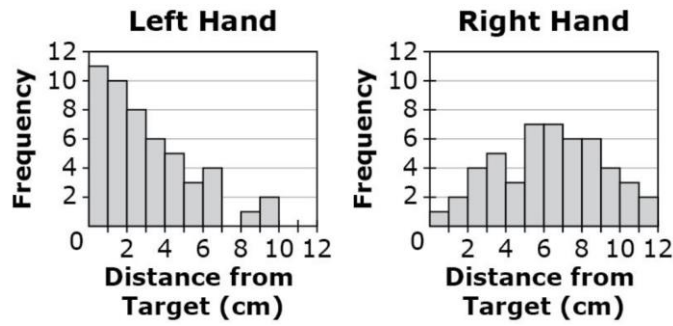
B. $f(n) = 2n - 2$, where $n \geq 0$ and n is an integer.

C. $f(n) = -2n + 2$, where $n \geq 1$ and n is an integer.

D. $f(n) = 2n$, where $n \geq 0$ and n is an integer.

MAFS.912.S-ID.1.2

53. Lisa was throwing a dart at a target. She threw 50 times with her left hand and 50 times with her right hand. The histograms show the distance Lisa missed the target by each time.



Which statement is an appropriate inference based on the median of each data set?

- A. Lisa has better aim with her left hand because the median for her left hand is greater than the median for her right hand.
- B. Lisa has better aim with her right hand because the median for her left hand is less than the median for her right hand.
- C. Lisa has better aim with her left hand because the median for her left hand is less than the median for her right hand.
- D. Lisa has better aim with her right hand because the median for her left hand is greater than the median for her right hand.

MAFS.912.S-ID.1.3

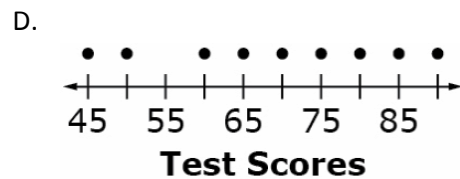
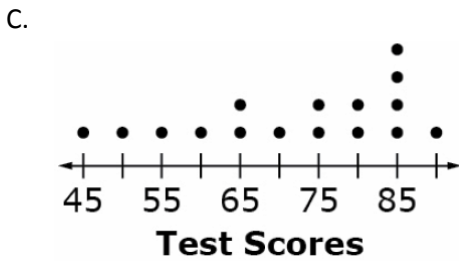
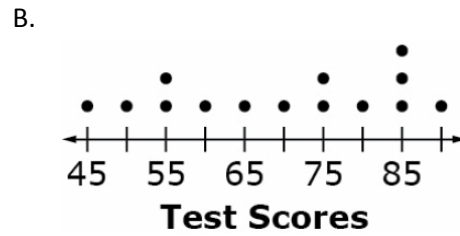
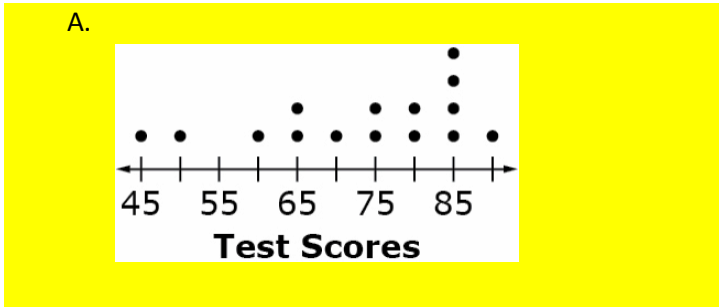
54. A car dealership has 41 cars for sale. The least expensive car costs \$11,999. The most expensive car costs \$19,499. Another car, priced at \$33,499, is added to the dealership’s inventory. Select whether the value of each statistic, for the prices of the cars, increases, decreases, or cannot be determined when the new car is added.

	<i>Increases</i>	<i>Decreases</i>	<i>Cannot Be Determined</i>
Mean	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Median	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Standard Deviation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MAFS.912.S-ID.1.1

55. Select the dot plot that represents the given test scores.

90, 45, 85, 70, 85, 50, 75, 85, 65, 75, 60, 85, 80, 65, 80



MAFS.912.A-APR.1.1

56. Which of the following best describes the sum of $ax^2 + bx + c$ and $mx^2 + nx + p$, where x is a variable and $a, b, c, m, n,$ and p are real numbers.

- A. The sum is a constant.
- B. The sum is an exponential expression.
- C. The sum is a polynomial.**
- D. Nothing can be determined about the sum without more information.

MAFS.912.S-ID.2.5

57. Carly surveyed some of her fellow students to determine whether they are more afraid of spiders or snakes, are equally afraid of both, or are afraid of neither. She organized the data into the two-way relative frequency table below. What is the joint relative frequency of the students surveyed who are boys and are equally afraid of both snakes and spiders?

	Spiders	Snakes	Both	Neither	Total
Boys	0.23	0.17	0.06	0.04	0.49
Girls	0.21	0.19	0.09	0.02	0.51
Total	0.43	0.36	0.15	0.06	1

(Note: Rounding may cause the totals to be off by 0.01.)

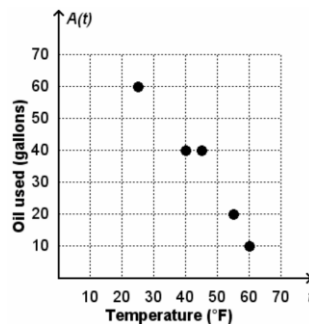
- A. 0.06**
- B. 0.09
- C. 0.15
- D. 0.40

58. Which of the following statements are supported by the survey data in the two-way frequency table?

	Right-handed	Left-handed	Total
Males	82	23	105
Females	79	16	95
Total	161	39	200

- The joint relative frequency that a person surveyed is female and left-handed is about 0.168, or 16.8%.
- The conditional relative frequency that a person surveyed is female, given that the person is right-handed, is about 0.4907, or 49.07%.
- The joint relative frequency that a person surveyed is male and is right-handed is about 0.41, or 41%.
- The conditional relative frequency that a person surveyed is right-handed, given that the person is male, is about 0.5093, or 50.93%.
- The marginal relative frequency that a person surveyed is left-handed is about 0.195, or 19.5%.

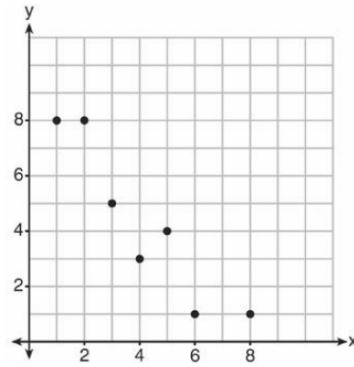
59. Emile collects data about the amount of oil A , in gallons, used to heat his house per month for 5 months and the average monthly temperature t , in degrees Fahrenheit, for those months. The scatter plot shows the data. The function $A(t) = -1.4t + 96$ best fits these data. Use $A(t)$ to determine which of the following statements are true.



- Emile would use about 82 gallons of oil to heat his house for a month with average temperature 10 °F.
- Emile would use about 85 gallons of oil to heat his house for a month with average temperature 15 °F.
- Emile would use 0 gallons of oil to heat his house for a month with average temperature 70 °F.
- Emile would use about 5 gallons of oil to heat his house for a month with average temperature 55 °F.
- Emile would use 96 gallons of oil to heat his house for a month with average temperature 0 °F.

MAFS.912.S-ID.3.8

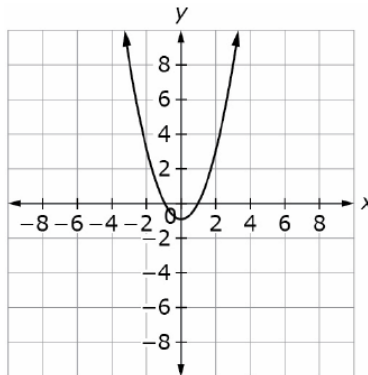
60. What is the correlation coefficient of the linear fit of the data shown below?



- A. 1.00
- B. 0.93
- C. -0.93
- D. -1.00

MAFS.912.A-REI.4.10

61. The graph of a quadratic function $y=f(x)$ is shown.



The points $(b, 13)$ and $(c, 13)$ are both on the graph of this function and $b \neq c$.

Select the consecutive integer interval on the number line that contains the value of b .

- A. $-4 < b < -3$
- B. $-4 < b < -2$
- C. $-3 < b < -2$
- D. $-3 < b < -1$

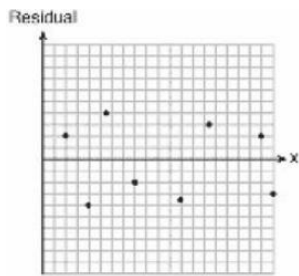
MAFS.912.S-ID.2.6c

62. Which statistic would indicate that a linear function would not be a good fit to model a data set?

A. $r = -0.93$

B. $r = 1$

C.



D.

