

*Getting ready for....*

# FSA Algebra 2 EOC



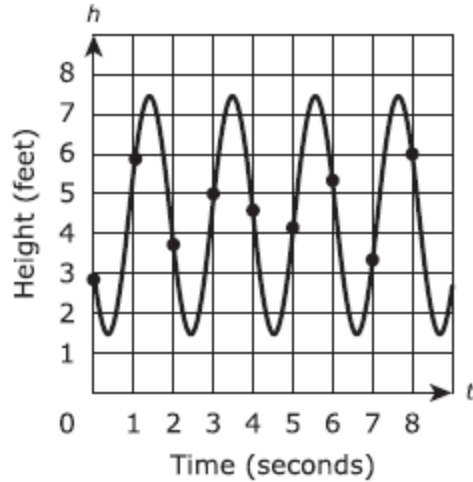
2014-2015  
**Student Packet**



## FS Algebra 2 EOC Review

MAFS.912.F-IF.2.6

1. The graph models the height  $h$  above the ground, in feet, at time  $t$ , in seconds, of a person swinging on a swing. Each point indicated on the graph represents the height of the person above the ground at the end of each one-second interval.



Select **two** time intervals for which the average rate of change in the height of the person is approximately  $-\frac{1}{2}$  feet per second.

- from 0 seconds to 1second
- from 1second to 2 seconds
- from 2 seconds to 3 seconds
- from 3 seconds to 4 seconds
- from 4 seconds to 5 seconds
- from 5 seconds to 6 seconds
- from 6 seconds to 7 seconds

MAFS.912.A-APR.1.1

2. What is the expanded form of  $3x(x + 2)^2$ ?

- A.  $3x^3 + 27x$
- B.  $3x^3 + 18x$
- C.  $3x^3 + 18x^2 + 18x$
- D.  $3x^3 + 18x^2 + 27x$

MAFS.912.A-REI.3.6

3. What is the value of  $z$  in the solution of the system of linear equations?

$$\begin{cases} x - 9y + 4z = 1 \\ -2x + 9y - 4z = -3 \\ 2x + y - 4z = -3 \end{cases}$$

Enter your answer in the box.

## FS Algebra 2 EOC Review

MAFS.912.F-BF.1.1

4. Which equation can be used to find the  $n$ th term for the sequence below?

2, 5, 10, 17, ...

$t = \text{term}$ $n = \text{term number}$
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- A.  $t = n + 3$
- B.  $t = n^2 + 1$
- C.  $t = 2n + 1$
- D.  $t = 3n - 1$

MAFS.912.S-IC.2.3

5. Which survey is least likely to contain bias?

- A. surveying a sample of people leaving a movie theater to determine which flavor of ice cream is the most popular
- B. surveying the members of a football team to determine the most watched TV sport
- C. surveying a sample of people leaving a library to determine the average number of books a person reads in a year
- D. surveying a sample of people leaving a gym to determine the average number of hours a person exercises per week

MAFS.912.A-REI.3.6

6. Solve the system:

$$\begin{cases} 3x - 4y = 100 \\ \frac{x}{3} + \frac{4y}{3} = 100 \end{cases}$$

- A.  $(0, -25)$
- B.  $(50, 12.5)$
- C.  $(50, 100)$
- D.  $(100, 50)$

MAFS.912.S-CP.1.5

7. Whenever Sara rents a movie, the probability that it is a horror movie is 0.57. Of the next five movies she rents, determine the probability, to the nearest hundredth, that no more than two of these rentals are horror movies. Enter your answer in the box.

MAFS.912.F-BF.2.3

8. How does the graph of the function  $g(x) = x^3 + 1$  compare to the parent function  $f(x) = x^3$ ?

- A. shifted up 1 unit
- B. shifted down 1 unit
- C. shifted left 1 unit
- D. shifted right 1 unit

## FS Algebra 2 EOC Review

MAFS.912.A-REI.4.11

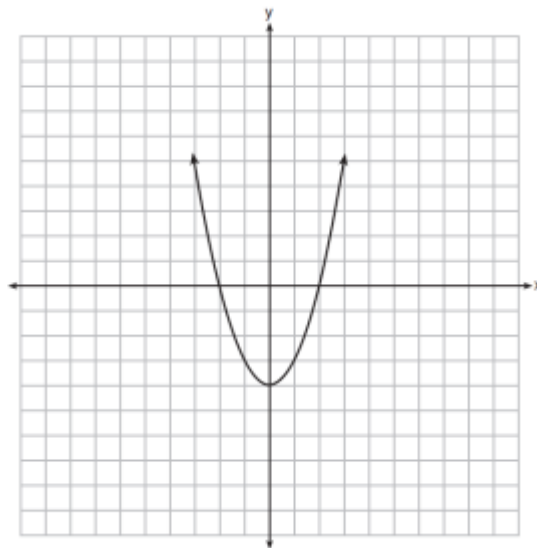
9. Given the functions  $h(x) = |x - 4| + 1$  and  $k(x) = x^2 + 3$ , which intervals contain a value of  $x$  for which  $h(x) = k(x)$ ?

Select **ALL** that apply.

- $-4.5 < x < -3$
- $-4.5 < x < -3$
- $-1.5 < x < 1.5$
- $1.5 < x < 3$
- $3 < x < 4.5$

MAFS.912.F-BF.2.3

10. The function  $f(x)$  is graphed on the set of axes below. On the same set of axes, graph  $f(x + 1) + 2$ .



MAFS.912.A-CED.1.2

11. Barry is planning to raise some money for his senior dues. He will sell sports drinks,  $a$ , for \$1.65 each and granola bars,  $b$ , for \$0.85 each. Which equation models how much money,  $t$ , Barry will raise from his sales?

- A.  $t = \frac{1.65a}{0.85b}$
- B.  $t = 1.65a + 0.85b$
- C.  $t = 1.65a - 0.85b$
- D.  $t = (1.65a)(0.85b)$

MAFS.912.F-IF.3.7e

12. Select **each** statement that is true about the graph of  $f(x) = \sin(x + 3) - 2$ .

- Amplitude: 1
- Amplitude: 2
- Midline:  $y = 2$
- $y$ -intercept:  $(0, -2)$
- $x$ -intercept:  $(0, 0)$

## FS Algebra 2 EOC Review

MAFS.912.A-SSE.2.3

13. A scientist places 7.35 grams of a radioactive element in a dish. The half-life of the element is 2 days. After  $d$  days, the number of grams of the element remaining in the dish is given by the function  $R(d) = 7.35\left(\frac{1}{2}\right)^{\frac{d}{2}}$ . Which statement is true about the equation when it is rewritten without a fractional exponent? Select **ALL** that apply.

- An approximately equivalent equation is  $R(d) = 7.35(0.250)^d$ .
- An approximately equivalent equation is  $R(d) = 7.35(0.707)^d$ .
- The base of the exponent in this form of the equation can be interpreted to mean that the element decays by 0.250 grams per day.
- The base of the exponent in this form of the equation can be interpreted to mean that the element decays by 0.707 grams per day.
- The base of the exponent in this form of the equation can be interpreted to mean that about 25% of the element remains from one day to the next day.
- The base of the exponent in this form of the equation can be interpreted to mean that about 70.7% of the element remains from one day to the next day.

MAFS.912.F-BF.2.3

14. Which best describes how the graph will be affected when the quadratic equation  $y = 3x^2 + 5$  is changed to  $y = 3x^2 - 2$ ?
- A. The graph moves up 7.
- B. The graph moves down 2.
- C. The graph moves down 7.
- D. The graph moves up 5.

MAFS.912.S-ID.1.4

15. In a certain school, the heights of the population of girls are normally distributed, with a mean of 63 inches and a standard deviation of 2 inches. If there are 450 girls in the school, determine how many of the girls are shorter than 60 inches. Round the answer to the nearest integer. Enter your answer in the box.

MAFS.912.A-REI.2.4

16. The equation  $2x^2 - 5x = -12$  is rewritten in the form of  $2(x - p)^2 + q = 0$ . What is the value of  $q$ ?
- A.  $\frac{167}{16}$
- B.  $\frac{71}{8}$
- C.  $\frac{25}{8}$
- D.  $\frac{25}{16}$

## FS Algebra 2 EOC Review

MAFS.912.A-SSE.2.4

17. A board is made up of 9 squares. A certain number of pennies is placed in each square, following a geometric sequence. The first square has 1 penny, the second has 2 pennies, the third has 4 pennies, etc. When every square is filled, how many pennies will be used in total?

- A. 512
- B. 511
- C. 256
- D. 81

MAFS.912.F-BF.2.3

18. Consider the function  $g(x) = a(3)^x$ , where  $a > 0$ . What happens to  $g(x)$  as the value of  $a$  increases?

- A.  $g(x)$  will increase at a faster rate.
- B.  $g(x)$  will increase at a slower rate.
- C.  $g(x)$  will decrease at a faster rate.
- D.  $g(x)$  will decrease at a slower rate.

19. Consider the expression  $3^x - 3^{x-2}$

### Part A

Which is an equivalent form of the given expression?

- A.  $3^x - 9(3^x)$
- B.  $3^x - 2(3^x)$
- C.  $3^x - \frac{1}{2}(3^x)$
- D.  $3^x - \frac{1}{9}(3^x)$

### Part B

This expression can also be rewritten in the form  $a(3^x)$ , where  $a$  is a constant. What is the value of  $a$ ?

- A.  $\frac{1}{9}$
- B.  $\frac{1}{2}$
- C.  $\frac{8}{9}$
- D.  $\frac{3}{2}$

MAFS.912.F-IF.2.4

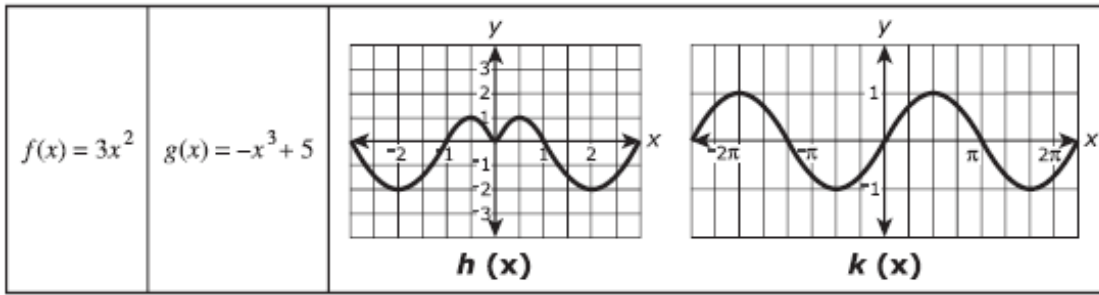
20. Which function has an  $x$  –intercept of 7?

- A.  $y = 7 + x^2$
- B.  $y = 7 - x^2$
- C.  $y = \sqrt{7} - \sqrt{x}$
- D.  $y = \sqrt{7} + \sqrt{x}$

## FS Algebra 2 EOC Review

MAFS.912.F-BF.2.3

21. Consider the functions  $f(x)$  and  $g(x)$  described by the equations and the functions  $h(x)$  and  $k(x)$  shown by graphs.

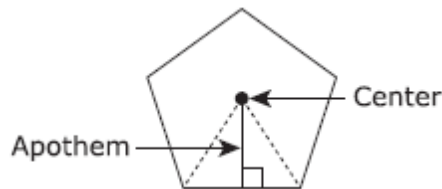


Which of the statements are true? Select all that apply.

- $f$  is an odd function.
- $f$  is neither an even nor odd function.
- $g$  is an even function.
- $g$  is neither an even nor odd function.
- $h$  is an even function.
- $h$  is an odd function.
- $k$  is an odd function.

MAFS.912.F-IF.2.6

22. The apothem of a regular polygon is the distance from the center to any side.



If the length of the apothem remains constant at 10 inches, the formula for the perimeter of a regular polygon as a function of the number of sides  $n$  is  $P(n) = 10\left(\tan \frac{360^\circ}{2n}\right)(2n)$ .

As the regular polygon changes from a pentagon (5 sides) to an octagon (8 sides), what is the approximate average rate of change in the perimeter?

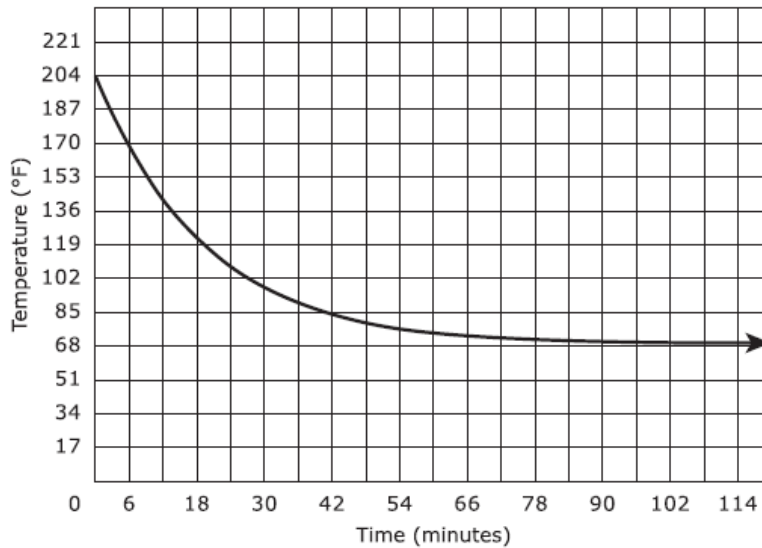
- A. decrease of 0.80 inches for each additional side
- B. decrease of 2.13 inches for each additional side
- C. decrease of 4.56 inches for each additional side
- D. decrease of 6.38 inches for each additional side



## FS Algebra 2 EOC Review

MAFS.912.F-IF.2.4

23. The graph represents the temperature, in degrees Fahrenheit ( $^{\circ}F$ ), of tea for the first 120 minutes after it was poured into a cup.



### Part A

Based on the graph, what was the temperature of the tea when it was first poured into the cup?

- A.  $68^{\circ}$
- B.  $114^{\circ}$
- C.  $136^{\circ}$
- D.  $204^{\circ}$

### Part B

Based on the graph, as the number of minutes increased, what temperature did the tea approach?

- A.  $68^{\circ}$
- B.  $114^{\circ}$
- C.  $136^{\circ}$
- D.  $204^{\circ}$

MAFS.912.A-REI.1.2

24. What is the solution to  $\sqrt{5x + 6} + 3 = 7$ ?

- A.  $x = \frac{4}{5}$
- B.  $x = 2$
- C.  $x = \frac{34}{5}$
- D.  $x = 8$

## FS Algebra 2 EOC Review

MAFS.912.F-BF.1.2

25. Paul started to train for a marathon. The table shows the number of miles Paul ran during each of the first three weeks after he began training.

Week	1	2	3
Distance (miles)	10	12	14.4

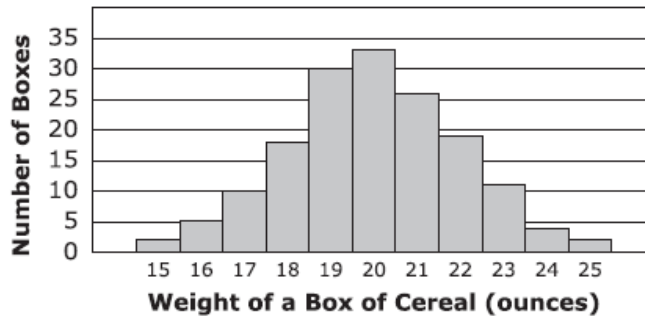
If this pattern continues, which of the listed statements could model the number of miles Paul runs  $a_n$ , in terms of the number of weeks,  $n$ , after he began training? Select **ALL** that apply.

- $a_n = 10 + 2(n - 1)$
- $a_n = 10n^2$
- $a_n = 10(1.2)^{n-1}$
- $a_1 = 10, \quad a_n = 1.2a_{n-1}$
- $a_1 = 10, \quad a_n = 2 + a_{n-1}$

MAFS.912.S-ID.1.4

26. The distribution of weights (rounded to the nearest whole number) of all boxes of a certain cereal is approximately normal with mean 20 ounces and standard deviation 2 ounces.

A sample of the cereal boxes was selected, and the weights of the selected boxes are summarized in the histogram shown.



### Part A

If  $w$  is the weight of a box of cereal, which range of weights includes all of the weights of cereal boxes that are within 1.5 standard deviations of the mean?

- A.  $17 \leq w \leq 23$
- B.  $18.5 \leq w \leq 21.5$
- C.  $19 \leq w \leq 21$
- D.  $20 \leq w \leq 23$

### Part B

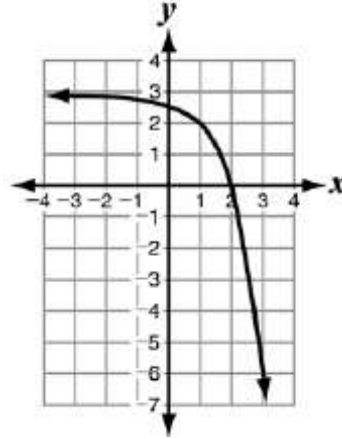
Which of these values is the best estimate of the number of boxes in the sample with weights that are more than 1.5 standard deviations above the mean?

- A. 2
- B. 6
- C. 17
- D. 36

## FS Algebra 2 EOC Review

MAFS.912.F-IF.3.7e

27. Which function is represented by the graph?



- A.  $y = -3^x + 3$
- B.  $y = -\left(\frac{1}{3}\right)^x + 3$
- C.  $y = -3^{x-1} + 3$
- D.  $y = -\left(\frac{1}{3}\right)^{x-1} + 3$

MAFS.912.A-CED.1.1

28. John is buying a car for \$8,000. The value of the car will decrease by 5% each year. Which equation can he use to predict the value of the car after 3 years?

- A.  $y = 8,000(0.05)^3$
- B.  $y = 8,000(1 - 0.5)^3$
- C.  $y = 8,000(1 - 0.05)^3$
- D.  $y = 8,000(1 + 0.05)^3$

MAFS.912.A-REI.4.11

29. Let  $f(x) = 14x^3 + 28x^3 - 46x$  and  $g(x) = 2x + 7$ . Which is the solution set to the equation  $\frac{1}{12}f(x) = g(x)$ ?

- A.  $\{-3, 0, 1\}$
- B.  $\{-3, -1, 2\}$
- C.  $\{-2, 1, 3\}$
- D.  $\{1, 5, 11\}$

MAFS.912.F-BF.2.3

30. Which of the following most accurately describes the translation of the graph  $y = -2(x - 6)^2 - 1$  to the graph  $y = -2(x - 4)^2$ ?

- A. up 1 and 2 to the right
- B. up 1 and 2 to the left
- C. down 1 and 2 to the right
- D. down 1 and 2 to the left

MAFS.912.F-IF.2.5

31. A box with an open top will be constructed from a rectangular piece of cardboard.

- The piece of cardboard is 8 inches wide and 12 inches long.
  - The box will be constructed by cutting out equal squares of side  $x$  at each corner and then folding up the sides.
- What is the entire domain for the function  $V(x)$  that gives the volume of the box as a function of  $x$ ?

- A.  $0 < x < 4$
- B.  $0 < x < 6$
- C.  $0 < x < 8$
- D.  $0 < x < 12$

## FS Algebra 2 EOC Review

MAFS.912.F-IF.2.4

32. Which function has a minimum value of 0?

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

MAFS.912.F-LE.1.3

33. Which function goes to positive  $\infty$  most quickly as  $x$  increases?

- A.  $y = \log(x) + 100$
- B.  $y = e^{x-9} - 3$
- C.  $y = x^2 + 5x + 6$
- D.  $y = 3x^5 + 4x^3 - 11x - 6$

MAFS.912.N-RN.1.2

34. If  $\sqrt[3]{(x+1)^5} = (x+1)^a$ , for  $x \geq -1$ , and  $a$  is a constant, what is the value of  $a$ ?

- A.  $\frac{3}{10}$
- B.  $\frac{5}{6}$
- C.  $\frac{5}{3}$
- D.  $\frac{10}{3}$

MAFS.912.A-APR.2.3

35. What are the real zeros of the function  $f(x) = x^3 + 6x^2 - 13x - 42$ ?

- A.  $-7, -3, -2$
- B.  $-7, 3, -2$
- C.  $-7, 3, 2$
- D.  $7, 3, -2$

MAFS.912.F-BF.2.4

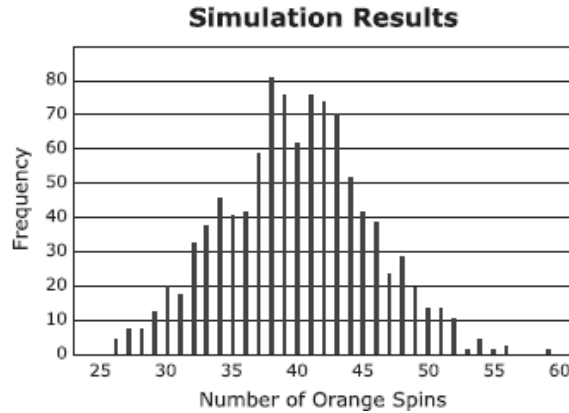
36. Which function is the inverse of  $f(x) = x^3 - 6$ ?

- A.  $f^{-1}(x) = x^3 + 6$
- B.  $f^{-1}(x) = \sqrt[3]{x} + 6$
- C.  $f^{-1}(x) = \sqrt[3]{x} - 6$
- D.  $f^{-1}(x) = \sqrt[3]{x+6}$

## FS Algebra 2 EOC Review

MAFS.912.S-IC.1.2

37. A circular spinner is divided into five sectors of different colors. A student spun the arrow on the spinner 200 times and recorded that the arrow stopped on the orange sector 38 times out of the 200 spins. To test whether the spinner was fair, the student used a computer to simulate the number of times the arrow stops on orange in 200 spins of a fair spinner equally divided into five sectors of different colors. The results of 1,000 trials of the simulation are shown.



Based on the results of the simulation, is there statistical evidence that the spinner is not fair?

- A. Yes, because 38 was the most frequent outcome.
- B. Yes, because about 8% of the outcomes were 38.
- C. No, because the distribution is approximately normal.
- D. No, because an outcome of 38 or less is not unusual.

MAFS.912.A-APR.2.2

38. If  $k$  is a constant, what is the value of  $k$  such that the polynomial  $k^2x^3 - 6kx + 9$  is divisible by  $x - 1$ ? Enter your answer in the box.

MAFS.912.F-LE.1.4

39. Carol invests her money in an account that is compounded continuously at a rate of 1.5%. Which expression represents the number of years it will take for her investment to triple?

- A.  $\frac{\ln 3}{1.5}$
- B.  $\frac{\ln 3}{0.015}$
- C.  $\frac{\ln 1.5}{3}$
- D.  $\frac{\ln 0.015}{3}$

MAFS.912.F-IF.3.8

40. Which function has  $x$ -intercepts of 2 and  $-5$ ?

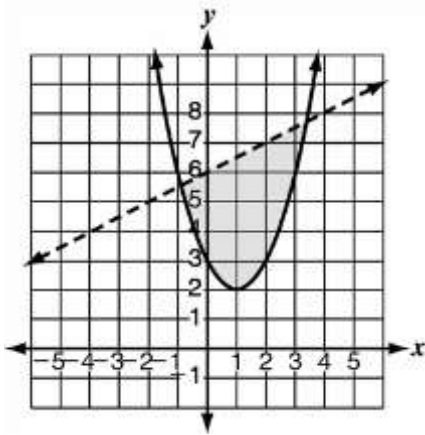
- A.  $f(x) = x^2 + 2x - 5$
- B.  $f(x) = x^2 - 3x - 10$
- C.  $f(x) = x^2 + 3x - 10$
- D.  $f(x) = x^2 + 7x + 10$

## FS Algebra 2 EOC Review

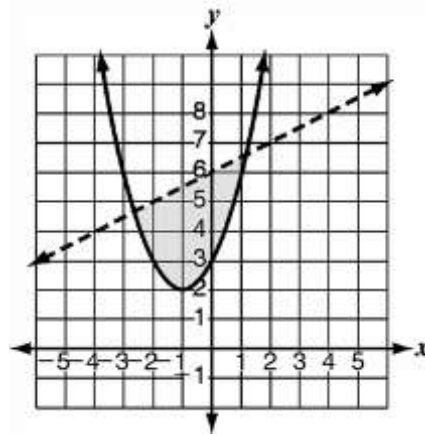
MAFS.912.A-CED.1.3

41. Which graph represents the solution set to the system  $y \leq (x - 1)^2 + 2$  and  $y < -\frac{1}{2}x + 6$ ?

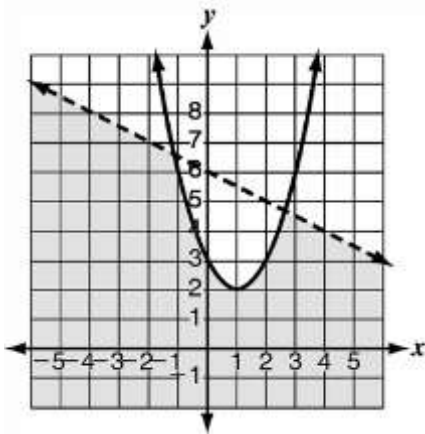
A.



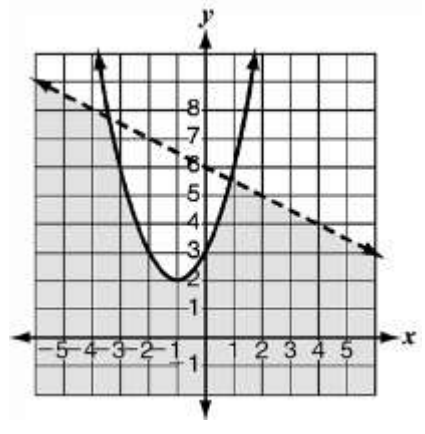
B.



C.



D.



MAFS.912.A-REI.3.7

42. How many points of intersection does the given system of equations have?

$$\begin{cases} y = 1 - x^2 \\ y = 2 = x \end{cases}$$

- A. none
- B. one
- C. two
- D. infinitely many

MAFS.912.A-REI.4.11

43. What is the point of intersection for  $f(x) = 2^x$  and  $g(x) = \left(\frac{1}{2}\right)^x$ ?

- A. (0, 1)
- B. (1, 0)
- C.  $\left(1, \frac{1}{2}\right)$
- D. (2, 4)

## FS Algebra 2 EOC Review

MAFS.912.F-BF.2.4

44. Which function is the inverse of  $f(x) = \frac{1}{2}x - 4$ ?

- A.  $f^{-1}(x) = \frac{1}{2}x + 2$
- B.  $f^{-1}(x) = \frac{1}{2}x + 4$
- C.  $f^{-1}(x) = 2x + 4$
- D.  $f^{-1}(x) = 2x + 8$

MAFS.912.F-TF.1.1

45. The diameter of a circle is 8 centimeters. A central angle of the circle intercepts an arc of 12 centimeters. What is the radian measure of the angle?

- A.  $\frac{3}{2}$
- B. 3
- C. 4
- D.  $8\pi$

MAFS.912.A-REI.1.2

46. Determine the solution(s) of the equation.

$$\frac{2m^2 + 3m - 5}{m^2 + 4m - 5} = 4$$

Select **ALL** that apply.

- 5
- $-\frac{15}{2}$
- $-\frac{5}{2}$
- 0
- 1

MAFS.912.F-IF.2.4

47. Which function has a y-intercept of -3?

- A.  $y = (x - 3)^5$
- B.  $y = x^5 - 3$
- C.  $y = (-3x)^5$
- D.  $y = -3x^5$

MAFS.912.S-IC.1.1

48. A reporter wants to know the percentage of voters in the state who support building a new highway. What is the reporter's population?

- A. the number of people who live in the state
- B. the people who were interviewed in the state
- C. all voters over 25 years old in the state
- D. all eligible voters in the state

## FS Algebra 2 EOC Review

MAFS.912.S-ID.1.4

49. In a set of test scores that are normally distributed, a test score of 76 is 3 standard deviations below the mean. A score of 88 is 1 standard deviation above the mean. What is the mean of the data?

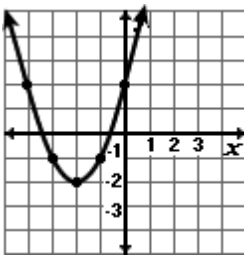
- A. 79
- B. 82
- C. 84
- D. 85

MAFS.912.F-IF.3.7a

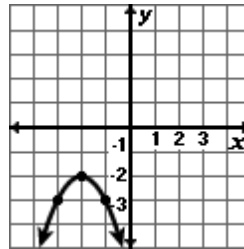
50. Which is the graph of the following function?

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

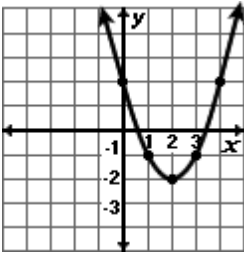
A.



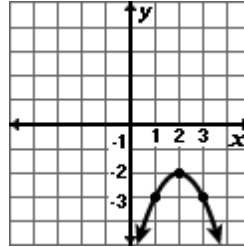
B.



C.



D.



MAFS.912.F-BF.1.1

51. Every day commuting to and from work, Jay drives his car a total of 45 miles. His car already has 2,700 miles on it. Which function shows the total number of miles Jay's car will have been driven after  $n$  more days?

- A.  $d(n) = 60$
- B.  $d(n) = 60n$
- C.  $d(n) = 45 + 2,700n$
- D.  $d(n) = 2,700 + 45n$

MAFS.912.A-APR.2.3

52. The graph of a polynomial function has the following  $x$ -intercepts: -3, 1, and 4. Which of these expressions represents such a function?

- A.  $(x - 1)(x + 3)(x - 4)$
- B.  $(x + 1)(x - 3)(x + 4)$
- C.  $(x + 1)(-3x + 1)(4x + 1)$
- D.  $(x - 1)(-3x - 1)(4x - 1)$



## FS Algebra 2 EOC Review

MAFS.912.A-APR.1.2

53. If dividing the polynomial  $f(x)$  by  $(x + 4)$  yields a remainder of  $-11$ , which of the following is true?

- A.  $f(-11) = -4$
- B.  $f(-11) = 4$
- C.  $f(-4) = -11$
- D.  $f(4) = -11$

MAFS.912.F-IF.3.9

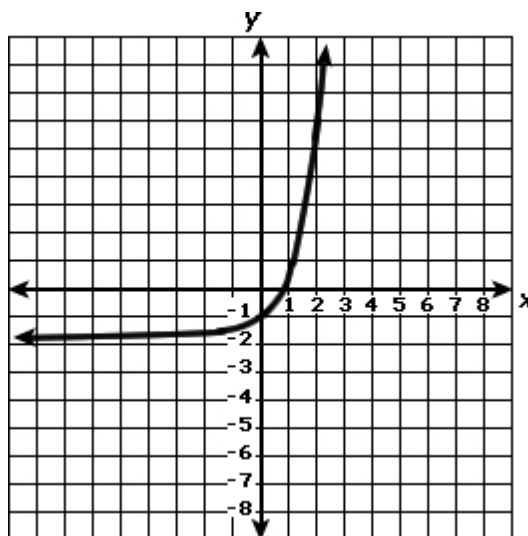
54. Which table(s) represent a function with the same y-intercept as  $f(x) = 2^x$ ?

Table 1		Table 2		Table 3	
x	y	x	y	x	y
1	4	1	4	1	1
2	8	2	16	2	2
3	16	3	64	3	4
4	32	4	256	4	8
5	64	5	1,024	5	16

- A. table 2 only
- B. table 3 only
- C. tables 1 and 2
- D. tables 1 and 3

MAFS.912.F-IF.3.7e

55. Which function is represented by the graph below?



- A.  $y = e^x - 2$
- B.  $y = e^x + 2$
- C.  $y = 2 - e^x$
- D.  $y = -2 - e^x$

## FS Algebra 2 EOC Review

MAFS.912.A-APR.4.6

56. Which expression shows  $\frac{x^3 - x^2 - x + 10}{x + 2}$  in simplest form?

- A.  $x^2 + 5$
- B.  $x^2 - 3x + 5$
- C.  $x^2 + x + 1 + \frac{12}{x+2}$
- D.  $x^2 - 3x + 7 + \frac{4}{x+2}$

MAFS.912.S-ID.1.4

57. Automobile manufacturers have to design the driver's seat area so that both tall and short adults can sit comfortably, reach all the controls and pedals, and see through the windshield. Suppose a new car is designed so that these conditions are met for people from 58 inches to 76 inches tall. The heights of adult men in the United States are approximately normally distributed with a mean of 70 inches and a standard deviation of 3 inches. Heights of adult women are approximately normally distributed with a mean of 64.5 inches and a standard deviation of 2.5 inches.

What percentage of men in the United States is this car not designed to accommodate? Enter your answer in the box.

What percentage of women in the United States is this car not designed to accommodate? Enter your answer in the box.

MAFS.912.N-CN.1.2

58. For the products listed,  $i$  represents the imaginary unit. Which of the products are real numbers? Select **ALL** that apply.

- $(8 - 2i)(8 + 2i)$
- $(8 - 2i)(5i)$
- $(3)(5i)$
- $(3)(-4)$
- $(i)(8 + 2i)$
- $(i)(5i)$

MAFS.912.S-IC.2.6

59. A study is done to determine which steroid cream is more effective for bug bites. If the only bug bites treated in this study were mosquito bites, which of the following is true?

- A. The steroid cream that is found to be the best will work for all bug bites.
- B. The steroid cream that is found to be the best will work only for mosquito bites.
- C. The study will only be able to produce results concerning the effect of the steroid creams on mosquito bites.
- D. The observational study is inherently biased.

## FS Algebra 2 EOC Review

MAFS.912.A-REI.3.6

60. What is the value of  $z$  in the solution of the system of linear equations?

$$\begin{cases} x - 9y + 4z = 1 \\ -2x + 9y - 4z = -3 \\ 2x + y - 4z = -3 \end{cases}$$

Enter your answer in the box.

MAFS.912.F-TF.1.2

61. Angle  $\theta$  is in Quadrant II, and  $\sin\theta = \frac{4}{5}$ . What is the value of  $\cos\theta$ ?

- A.  $\frac{4}{5}$
- B.  $\frac{3}{5}$
- C.  $-\frac{3}{5}$
- D.  $-\frac{4}{5}$

MAFS.912.S-IC.2.5

62. A recent claim has been made that people who have an iPad spend more time on the iPad than people who spend time on their Tablets. After all calculations are performed, the study noted the  $t$  statistic to be 2.8, with 24 degrees of freedom, a two-tail test, and a significance level of 0.01. Is there truly a significant difference between the two data sets?

- A. Yes, because  $p > \alpha$
- B. Yes, because  $p < \alpha$
- C. No, because  $p < \alpha$
- D. No, because  $p > \alpha$

MAFS.912.A-REI.1.2

63. What extraneous solution arises when the equation  $\sqrt{x + 3} = 2x$  is solved for  $x$  by first squaring both sides of the equation?

Enter your answer in the box.

MAFS.912.F-BF.1.1b

64. The functions  $f$  and  $g$  are defined by  $f(x) = x^2$  and  $g(x) = 2x$ , respectively. Which equation is equivalent to

$$h(x) = \frac{f(2x)g(-2x)}{2}?$$

- A.  $h(x) = -2x^3$
- B.  $h(x) = -8x^3$
- C.  $h(x) = x^2 - 2x$
- D.  $h(x) = 2x^2 + 2x$

## FS Algebra 2 EOC Review

Consider the equation  $\frac{4^{x^2}}{2^x} = 2$  to answer questions 65 and 66.

MAFS.912.A-SSE.2.3

65. Which equation is equivalent to the equation shown? Select the correct answer.

- A.  $2^{x^2} = 2$
- B.  $2^{x^2-x} = 2$
- C.  $2^{2x} = 2$
- D.  $2^{2x^2-x} = 2$

MAFS.912.F-LE.1.4

66. Which values are solutions to the equation? Select **ALL** that apply.

- 2
- 1
- $-\frac{1}{2}$
- $\frac{1}{2}$
- 1
- 2

MAFS.912.S-IC.2.4

67. A company specializing in building robots that clean your house has found that the average amount of time kids spend cleaning their houses is about 2 hours per week. If their sample size was 1000 randomly chosen kids and the standard deviation was 0.3 hours, what is the margin of error for a confidence interval of 95%?

- A. 0.392
- B. 0.018
- C. 0.039
- D. 0.185

MAFS.912.A-SSE.1.2

68. The expression  $x^2(x - y)^3 - y^2(x - y)^3$  can be written in the form  $(x - y)^a(x + y)$ , where  $a$  is a constant.

What is the value of  $a$ ?

Enter your answer in the box.

MAFS.912.F-IF.3.8

69. If  $z > 0$  and  $z^x z^y = 81$ , what is the value of  $z$ ?

## FS Algebra 2 EOC Review

### MAFS.912.S-IC.2.3

70. A researcher is studying the effects of aspirin on the sleep patterns of patients. Which scenario describes an observational study?
- A. Find 100 patients who regularly suffer from headaches, 50 of whom regularly use aspirin, and 50 of whom use an alternative medication. Over a 2-month period, collect data on the sleep patterns of the 100 patients, analyze the data, and draw conclusions.
  - B. Find 100 patients who regularly suffer from headaches. Randomly assign 50 of the patients to an aspirin treatment, and assign the others to an alternative treatment. Over a 2-month period, collect data on the sleep patterns of the 100 patients, analyze the data, and draw conclusions.
  - C. Find 100 patients who suffer from sleep disorders. Assign 50 of the patients to an aspirin treatment, and assign the others to an alternative treatment. Over a 2-month period, collect data on the sleep patterns of the 100 patients, analyze the data, and draw conclusions.
  - D. Find 100 patients who regularly take aspirin. Randomly select 50 of the patients to stop their aspirin treatments and to take an alternative medicine instead. Over a 2-month period, collect data on the sleep patterns of the 100 patients, analyze the data, and draw conclusions.

### MAFS.912.N-RN.1.2

71. Given that  $x > 0$ , which expression is equivalent to  $5\sqrt{xy} + 25\sqrt{x}$ ?

- A.  $5(xy)^{-1} + 25x^{-1}$
- B.  $25x^{\frac{1}{2}}(\sqrt{y} + 5)$
- C.  $\sqrt{x}(25y^{\frac{1}{2}} + 5)$
- D.  $5x^{\frac{1}{2}}(y^{\frac{1}{2}} + 5)$

### MAFS.912.S-ID.1.4

72. The mileages of the vehicles in a government fleet are normally distributed with a mean of 60,000 miles and a standard deviation of 8,000 miles. If a vehicle from the fleet is randomly selected, which is closest to the probability that the mileage is greater than 44,000 miles?
- A. 0.48
  - B. 0.68
  - C. 0.95
  - D. 0.98

### MAFS.912.N-CN.1.2

73. What is the complex conjugate of  $\sqrt{-400} + 17$ ?

- A.  $20 - 17i$
- B.  $20 + 17i$
- C.  $17 - 20i$
- D.  $17 + 20i$

## FS Algebra 2 EOC Review

MAFS.912.A-SSE.2.4

74. DeShawn is in his fifth year of employment as a patrol officer for the Metro Police. His salary for his first year of employment was \$47,000. Each year after the first, his salary increased by 4% of his salary the previous year.

### Part A

What is the sum of DeShawn's salaries for his first five years of service?

- A. \$101,983
- B. \$188,000
- C. \$219,932
- D. \$254,567

### Part B

If DeShawn continues his employment at the same rate of increase in yearly salary, for which year will the sum of his salaries first exceed \$1,000,000? Give your answer to the nearest integer.

Enter your answer in the box.

MAFS.912.N-CN.1.2

75. Which is equivalent to  $(2 - 5i)(-2 + 5i)$ ?

- A. 21
- B. -29
- C.  $21 + 20i$
- D.  $-29 - 20i$

MAFS.912.F-BF.2.4

76. What is the inverse of  $g(x) = \sqrt{(5x - 2)} + 1$ , for all  $x \geq \frac{2}{5}$ ?

- A.  $g^{-1}(x) = \frac{(x-1)^2+2}{5}$
- B.  $g^{-1}(x) = \frac{(x-1)^2}{5} + 2$
- C.  $g^{-1}(x) = \frac{(x+1)^2-2}{5}$
- D.  $g^{-1}(x) = \frac{(x+1)^2}{5} - 2$

MAFS.912.S-IC.2.6

77. A grocery store manager wants to determine how many servings of fresh fruit her adult customers eat per day. She randomly surveys adult customers in the produce aisle of her store about their eating habits. Which statement best explains why her survey could be biased?

- A. The sample does not include children.
- B. The produce aisle contains more than just fresh fruit.
- C. Adults who do not eat fresh fruit are less likely to shop in a local grocery store.
- D. Adults who do not eat fresh fruit are less likely to be found in the produce aisle.

## FS Algebra 2 EOC Review

MAFS.912.S-CP.1.4

78. The two-way table shows the classification of students in a mathematics class by gender and dominant hand. A student who is ambidextrous uses both hands equally well.

	Right-handed	Left-handed	Ambidextrous	Total
Male	11	4	1	16
Female	12	2	0	14
Total	23	6	1	30

### Part A

What is the probability that a randomly selected student in the class is female given that the student is right-handed?

- A.  $\frac{1}{12}$
- B.  $\frac{12}{30}$
- C.  $\frac{12}{23}$
- D.  $\frac{23}{30}$

### Part B

One student will be selected at random from the class.

Consider the events:

- X the selected student is female
- Y the selected student is right-handed

Which statement about events X and Y is true?

- A. The events are independent because the number of right-handed students in the class is larger than the number of female students.
- B. The events are independent because the number of categories for dominant hand is different from the number of categories for gender.
- C. The events are not independent because for one of the dominant hand categories the number of female students is 0.
- D. The events are not independent because the probability of X is not equal to the probability of X given Y.

MAFS.912.A-CED.1.4

79. The period for a pendulum to complete one swing is  $t$ , the time in seconds. The period can be approximated by the formula  $t = 2\pi\sqrt{\frac{l}{9.81}}$ , where  $l$  is the length of the pendulum in meters. If the period of a pendulum is 2.5 seconds, which is closest to the length of the pendulum?

- A. 1.55 meters
- B. 3.17 meters
- C. 3.90 meters
- D. 9.76 meters

## FS Algebra 2 EOC Review

MAFS.912.S-IC.2.3

80. The manager of food services at a local high school is interested in assessing student opinion about a new lunch menu in the school cafeteria. The manager is planning to conduct a sample survey of the student population.

**Part A**

Which of the listed methods of sample selection would be the most effective at reducing bias?

- A. Randomly select one day of the week and then select the first 30 students who enter the cafeteria on that day.
- B. Post the survey on the school Web site and use the first 30 surveys that are submitted.
- C. Randomly select 30 students from a list of all the students in the school.
- D. Randomly select one classroom in the school and then select the first 30 students who enter that classroom.

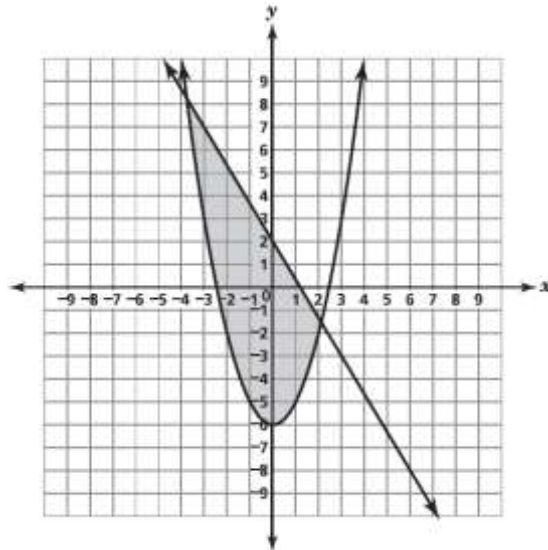
**Part B**

The manager wants to know if a student's gender is related to the student's opinion about the menu. Which statement **best** describes the study?

- A. This is an observational study and therefore the manager will be able to establish a cause-and-effect relationship between gender and opinion.
- B. This is an observational study and therefore the manager will not be able to establish a cause-and-effect relationship between gender and opinion.
- C. This is an experimental study and therefore the manager will be able to establish a cause-and-effect relationship between gender and opinion.
- D. This is an experimental study and therefore the manager will not be able to establish a cause-and-effect relationship between gender and opinion.

MAFS.912.A-CED.1.3

81. Which system of inequalities is best represented by the shaded region of this graph?



- A.  $\begin{cases} 3x + 5y \leq 10 \\ x^2 - y \leq 6 \end{cases}$
- B.  $\begin{cases} 5x + 3y \leq 6 \\ x^2 - y \leq 6 \end{cases}$
- C.  $\begin{cases} 3x + 5y \leq 10 \\ x^2 - y \geq 6 \end{cases}$
- D.  $\begin{cases} 5x + 3y \leq 6 \\ x^2 - y \geq 6 \end{cases}$



## FS Algebra 2 EOC Review

MAFS.912.A-REI.3.7

82. Which ordered pair is a solution to this system of equations?

$$\begin{cases} x^2 - 6x + 11 \\ y = -3x + 9 \end{cases}$$

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

MAFS.912.F-TF.3.8

83. Angle  $\theta$  is in Quadrant IV, with  $\cos \theta = \frac{4}{5}$ . What is  $\sin \theta$ ?

- A.  $-\frac{3}{4}$
- B.  $-\frac{3}{5}$
- C.  $\frac{9}{25}$
- D.  $\frac{3}{5}$

MAFS.912.A-APR.3.4

84. Dennis used a method for squaring two-digit numbers that end in 5. The method states to find the values that end in 0 before and after this number, multiply them and combine the result with the square of 5. If  $x$  represents the two-digit number to be squared, which of the following polynomial identities can be used to justify this method?

- A.  $x^2 = (x - 5)^2 + 5^2$
- B.  $x^2 = (x - 5)^2 - 5^2$
- C.  $x^2 = (x - 5)(x + 5) + 5^2$
- D.  $x^2 = (x - 5)(x + 5) - 5^2$

MAFS.912.N\_RN.1.1

85. **Part A**

Express  $\sqrt{125}$  using rational exponents in two different ways, one with base 5 and the other with base 25.

**Part B**

Use the properties of exponents to show that the two expressions you wrote above are equivalent to  $\sqrt{125}$ .

## FS Algebra 2 EOC Review

MAFS.912.A-REI.1.1

86. What process was used to obtain the equation shown in Step 2?

Step 1:  $\frac{x}{5} - \frac{1}{6} = 2$

Step 2:  $6x - 5 = 60$

- A. Added  $\frac{1}{6}$  to both sides of the equation.
- B. Added 58 to both sides of the equation.
- C. Multiplied both sides of the equation by 30.
- D. Divide both sides of the equation by 30.

MAFS.912.F-LE.2.5

87. The number of maps remaining at an information booth can be modeled by the function  $f(x) = 274 - 32x$ , where  $x$  is the number of hours that have elapsed since the booth opened. Which statement is true?

- A. Every hour, 274 maps are given away.
- B. Every hour, 242 maps are given away.
- C. There were 32 maps at the booth before it opened.
- D. There were 274 maps at the booth before it opened.

MAFS.912.N-CN.3.7

88. What are the complex solutions to the following equation:

$$0.5x^2 - 0.2x + 0.2 = 0$$

- A.  $2 \pm 6i$
- B.  $6 \pm 2i\sqrt{2}$
- C.  $2 \pm 6i\sqrt{2}$
- D.  $0.2 \pm 0.6i$

MAFS.912.N-CN.1.1

89. What component of a complex number does the term  $6i$  represent in the following expression?

$$8 + 6i$$

- A. irrational number
- B. fractional number
- C. real number
- D. imaginary number

MAFS.912.G-GPE.1.2

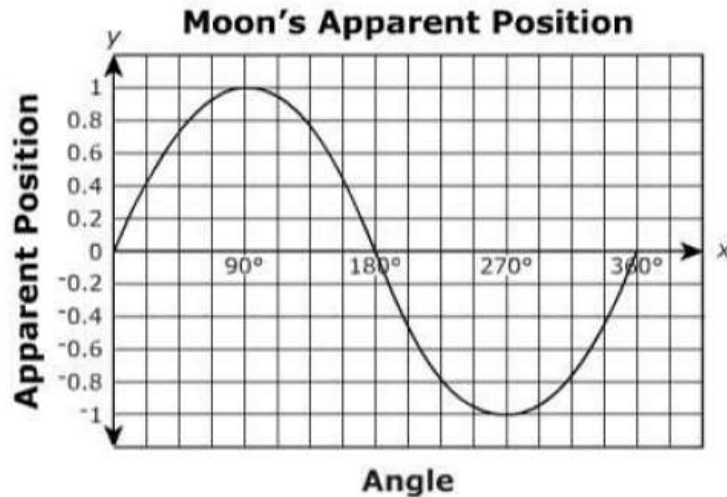
90. Which equation represents all points,  $(x, y)$ , that are equidistant from  $(-3, 4)$  and the line containing  $(1, -5)$  and  $(1, 5)$ ?

- A.  $-16(y - 4) = (x + 3)^2$
- B.  $-16(x + 3) = (y - 4)^2$
- C.  $-8(x + 1) = (y - 4)^2$
- D.  $-8(y - 4) = (x + 1)^2$

## FS Algebra 2 EOC Review

MAFS.912.F-TF.2.5

91. The apparent position of a moon varies sinusoidally with the changing angle from a line of sight as it orbits Jupiter. The moon's apparent position is shown in the graph below.



Which are the closest amplitude and period of the moon's orbit?

- A. Amplitude = 0.5 and Period =  $180^\circ$
- B. Amplitude = 0.5 and Period =  $360^\circ$
- C. Amplitude = 1 and Period =  $180^\circ$
- D. Amplitude = 1 and Period =  $360^\circ$

MAFS.912.S-CP.1.2

92. Olivia selects marbles from a bag containing 5 red and 7 blue marbles. Which of the following events are independent?
- A. selecting two red marbles in one pick
  - B. selecting a red and blue marble in one pick
  - C. selecting one red and one blue in two picks with replacement
  - D. selecting one red and one blue in two picks without replacement

MAFS.912.A-SSE.1.1

93. Dee is driving home from a conference. The expression  $705 - 60h$  gives the number of miles from home after driving  $h$  hours. Which best represents the meaning of the term  $60h$ ?
- A. the number of miles Dee drove in  $h$  hours
  - B. the number of miles Dee drove each hour
  - C. the number of miles Dee drove each hour
  - D. the number of miles Dee had left to drive after driving  $h$  hours

MAFS.912.S-CP.1.3

94. If events A and B are independent, which statement must be true about the conditional probability of A given B?
- A. The probability of event A > the conditional probability of event B given A.
  - B. The probability of event A = the conditional probability of event B given A.
  - C. The probability of event A > the conditional probability of event A given B.
  - D. The probability of event A = the conditional probability of event A given B.

## FS Algebra 2 EOC Review

MAFS.912.N-CN.3.7

95. What values of  $x$  make this equation true?

$$-(2x + 6)^2 + 14 = 30$$

- A.  $-1, -5$
- B.  $1, 5$
- C.  $-3 - 2i, -3 + 2i$
- D.  $3 + 2i, 3 - 2i$

MAFS.912.S-CP.2.6

96. At Lincoln Heights Junior High, students have the option to participate in two electives, Art and Band. Seventy-five percent of the students participate in Art and 55% participate in Band. What is the probability that a student is enrolled in Band given that the same student is enrolled in Art?

- A. 40%
- B. 55%
- C. 65%
- D. 73%

MAFS.912.S-ID.1.4

97. The mean of a normal distribution is 70 with a standard deviation of 5. If a value is randomly selected from this distribution, which is closest to the probability that the selected value is greater than or equal to 75?

- A. 0.16
- B. 0.34
- C. 0.66
- D. 0.84

MAFS.912.F-TF.1.1

98. Which degree measure is equivalent to  $\frac{11\pi}{18}$ ?

- A.  $220^\circ$
- B.  $110^\circ$
- C.  $55^\circ$
- D.  $10^\circ$

MAFS.912.S-CP.2.7

99. The probability that Flight 9876 will be late is 0.27. The probability that Flight 123 will be late is 0.11. The probability that both flights will be late is 0.09. What is the probability that Flight 9876 or Flight 123 will be late?

- A. 0.47
- B. 0.38
- C. 0.29
- D. 0.07

## FS Algebra 2 EOC Review

MAFS.912.F-TF.2.5

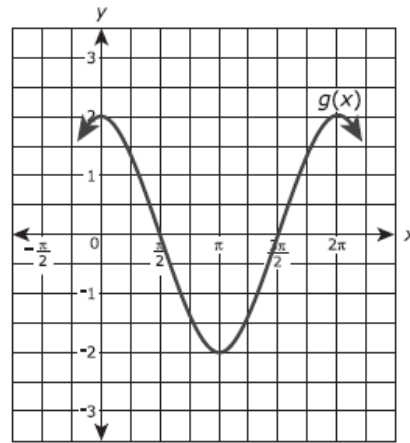
100. A wave on an oscilloscope has an amplitude of 2 millimeters and a frequency of 550 cycles per second. The wave can be modeled by a cosine function. Which equation best represents  $h$ , the height in millimeters from the equilibrium position, as a function of  $t$ , the time in seconds?

- A.  $h = \cos(550\pi t)$
- B.  $h = \cos(1100\pi t)$
- C.  $h = 2\cos(550\pi t)$
- D.  $h = 2\cos(1100\pi t)$

MAFS.912.F-BF.2.3

101. **Part A**

The function  $f(x) = \cos(x)$ . Function  $g(x)$  results from a transformation on the function  $f(x) = \cos(x)$ . A portion of the graph of  $g(x)$  is shown.

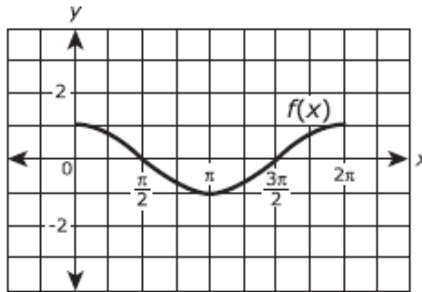


What is the equation of  $g(x)$ ?

- A.  $g(x) = \cos(x) - 2$
- B.  $g(x) = \cos(x) + 2$
- C.  $g(x) = \cos(2x) + 2$
- D.  $g(x) = 2\cos(x) + 2$

**Part B**

The graph shows  $f(x) = \cos(x)$  on the interval  $0 \leq x \leq 2\pi$ .



Function  $h$  is a transformation of such that  $h(x) = -f(x)$ . Which of the following statements is true? Select **EACH** correct statement.

- Function  $f$  is an even function.
- Function  $f$  is an odd function.
- Function  $f$  is neither an even nor odd function.
- Function  $h$  is an even function.
- Function  $h$  is an odd function.
- Function  $h$  is neither an even nor odd function.