Algebra II EOI Test Review

1. Which is equivalent to $15^{-\frac{2}{3}}$?

A $\frac{1}{\sqrt[3]{15^2}}$

B $\frac{1}{\sqrt[2]{15^3}}$

C $-\sqrt[3]{15^2}$

D $-\sqrt[2]{15^3}$

2. Which expression is another way to write $\sqrt[4]{5x^3}$?

A $5^{\frac{1}{4}}x^{\frac{3}{4}}$

B $5^{\frac{4}{1}}x^{\frac{4}{3}}$

C $5^{\frac{3}{4}}x^{\frac{3}{4}}$

D $5^{\frac{4}{3}}x^{\frac{4}{3}}$

3. What is the simplified expression of $\sqrt{\frac{36x^8}{4x^6}}$?

A $3|x|$

B $9|x|$

C $3x^2$

D $9x^2$

4. What is the simplified form of $(2\sqrt{5}+3)(\sqrt{5}-1)$?

A $\sqrt{5}-3$

B $\sqrt{5}+7$

C $2\sqrt{5}-3$

D $2\sqrt{5}+7$

5. If x and y are positive real numbers, which expression is equivalent to $(16x^5y^8)^{\frac{1}{2}}$?

A $8x^3y^6$

B $4x^3y^6$

C $8x^{\frac{5}{2}}y^4$

D $4x^{\frac{5}{2}}y^4$

6. What is the sum of $\frac{1}{3\sqrt{25}}$ and $\frac{1}{2\sqrt[3]{27}}$?

A $\frac{2}{21}$

B $\frac{7}{30}$

C $\frac{2}{33}$

D $\frac{11}{90}$

7. The area of a square is $2\sqrt{2}+3$. What is the length of a side of the square?

A $\sqrt{2}-1$

B $\sqrt{2}+1$

C $2\sqrt{2}-1$

D $2\sqrt{2}+1$

8. $\frac{8x^6z^4+4x^4z^2}{4x^2z}$

Which expression represents the quotient?

A $2x^4z^3+x^2z$

B $2x^3z^4+x^2z^2$

C $4x^4z^3+3x^2z$

D $4x^3z^4+3x^2z^2$

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9. $(y^2 - 4y - 32) \div (y + 4)$

Which expression represents the quotient?

A $y - 8$

B $y + 8$

C $y - 4$

D $y + 4$

10. A rectangular prism has a volume of $8x^3 + 14x^2 + x - 2$ and a height of $2x + 1$. Which expression represents the area of the base of the prism?

$V = Bh$

A $4x^2 + 5x - 2$

B $4x^2 + 5x + 2$

C $4x^2 + 9x + 4$

D $4x^2 + 9x + 5$

11. What is $(3x^5 - 15x^4 + 4x^3 + 11x^2 - 9x + 2)$ divided by $(x^2 - 5x + 2)$?

A $3x^3 - 2x + 1$

B $3x^3 - 2x^2 + 7$

C $3x^3 - 2x^2 + 7x + 26$

D $3x^3 - 30x^2 + 160x - 849$

12. Which expression is equivalent to $\frac{x^2 + x - 12}{x^2 - 6x + 9}$?

A $\frac{x - 3}{x + 4}$

B $\frac{x + 4}{x - 3}$

C $2x^2 - 5x - 3$

D $2x^2 + 7x + 21$

13. $\frac{4x^2y}{8xy^2} \div \frac{12xy^2}{8x^6y^3}$

Which expression represents the quotient?

A $\frac{x^5}{3}$

B $\frac{3}{x^5}$

C $\frac{x^6}{3}$

D $\frac{3}{x^6}$

14. $\frac{3x - 1}{x + 2} - \frac{x - 2}{x - 1}$

Which expression represents the result of this subtraction?

A $\frac{2x + 1}{3}$

B $\frac{2x + 1}{x^2 + x - 2}$

C $\frac{3x^2 - 4x + 5}{3}$

D $\frac{2x^2 - 4x + 5}{x^2 + x - 2}$

Which expression is equivalent to $2 - x - \frac{1}{3 - x}$?

A $\frac{1}{3 - 2x}$

B $\frac{x^2 - x + 3}{3 - x}$

C $\frac{x^2 - 5x + 5}{3 - x}$

D $\frac{x^2 - 5x + 7}{3 - x}$

16. Which expression is equivalent to $(4i)^3$?

A $-12i$

B $12i$

C $-64i$

D $64i$

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17. A circuit has a current of $(8 + 7i)$ amps, and another circuit has a current of $(5 - 3i)$ amps. What is the difference between the currents of the two circuits?

A $(3 - 4i)$ amps

B $(3 + 4i)$ amps

C $(3 - 10i)$ amps

D $(3 + 10i)$ amps

18. Which expression is equivalent to $\sqrt{-6}\left(\sqrt{-4} - \sqrt{3}\right)$?

A $2\sqrt{6} + 3\sqrt{2}$

B $-24 - 6i\sqrt{3}$

C $2\sqrt{6} - 3i\sqrt{2}$

D $-2\sqrt{6} - 3i\sqrt{2}$

19. What is the product of $(2 + 3i)$ and $(5 - 4i)$?

A $-2 - 23i$

B $-2 + 7i$

C $22 - 23i$

D $22 + 7i$

20. Which expression is equivalent to $\frac{2}{5 + i}$?

A $\frac{5 - i}{12}$

B $\frac{5 + i}{12}$

C $\frac{5 - i}{13}$

D $\frac{5 + i}{13}$

21. $y = (x - 3)^2$

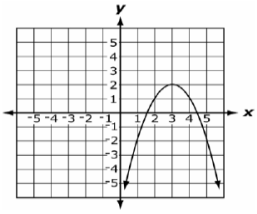
What is the parent graph of this function and what transformations have taken place on it?

A The parent graph is $y = x$, which is translated 3 units to the left.

B The parent graph is $y = x$, which is translated 3 units to the right.

C The parent graph is $y = x^2$, which is translated 3 units to the left.

D The parent graph is $y = x^2$, which is translated 3 units to the right.

22. 

What is the parent function of this graph?

A $f(x) = x^2$

B $f(x) = |x|$

C $f(x) = x$

D $f(x) = x^3$

23. If $f(x) = 3x^2 - 2$ and $g(x) = 4x + 2$, what is the value of $(f + g)(-1)$?

A -7

B -1

C 1

D 7

24. If $f(x) = x^2 - 1$ and $g(x) = x - 1$, which expression is equivalent to $\left(\frac{f}{g}\right)(x)$?

A $x - 1$

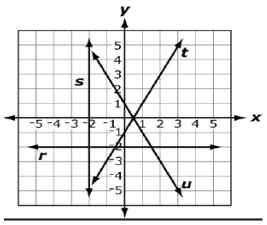
B $x + 1$

C $\frac{1}{x-1}$

D $\frac{1}{x+1}$

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25.



If $f(x) = x - \frac{1}{2}$ and $g(x) = -2$, which graph corresponds to the function $(fg)(x)$?

A line R

B line S

C line T

D line U

26. If $f(x) = 2x + 5$ and $g(x) = 3x$, what is the value of $(f \circ g)(1)$?

A 8

B 10

C 11

D 17

27.

$$f(x) = 2x + 7$$

$$g(x) = 3x^2 - 1$$

Which expression represents $f(g(x))$?

A $6x^2 + 5$

B $6x^2 + 12$

C $3x^2 - 2x - 8$

D $3x^2 + 2x + 6$

28. If $(f \circ g)(x) = 2x - 1$, how might $f(x)$ and $g(x)$ be defined?

A $f(x) = (x - 1)$ and $g(x) = (2x - 1)$

B $f(x) = (x - 1)$ and $g(x) = (2x + 1)$

C $f(x) = (2x - 1)$ and $g(x) = (x - 1)$

D $f(x) = (2x + 1)$ and $g(x) = (x - 1)$

29. Which statement is <u>true</u> for the function $f(x) = \frac{1}{x+4}$?

A 4 is not in the range of the function.

B 4 is not in the domain of the function.

C -4 is not in the range of the function.

D -4 is not in the domain of the function.

30. What is the domain of the function $f(x) = \frac{x + 5}{x^2 + 2x - 8}$?

A $\{x : x \neq 0\}$

B $\{x : x \neq -5\}$

C $\{x : x \neq -2, 4\}$

D $\{x : x \neq 2, -4\}$

31. What is the domain of the function $f(x) = \sqrt{4 - x}$?

A $\{x : x \geq 4\}$

B $\{x : x \leq 4\}$

C $\{x : x \geq -4\}$

D $\{x : x \leq -4\}$

32. Which intervals correctly define the domain of $f(x) = \frac{1}{x + 4} - 2$?

A $(-\infty, 4)$ and $(4, \infty)$

B $(-\infty, -4)$ and $(4, \infty)$

C $(-\infty, -4)$ and $(-4, \infty)$

D $(-\infty, -4)$ and $(-2, \infty)$

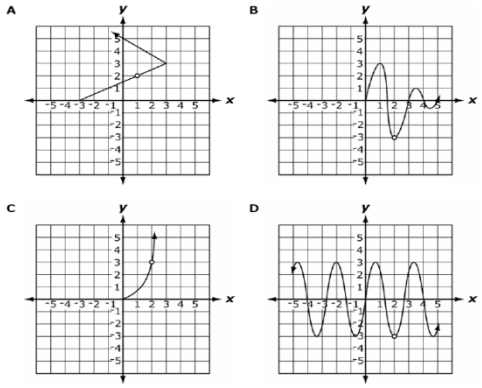
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33.

Domain: $\{x \mid x \geq 0, x \neq 2\}$

Range: $\{y \mid -3 < y \leq 3\}$

Which graph corresponds to the given constraints?



34.

Which function has the fewest domain restrictions for real numbers?

A $f(x) = \frac{1}{x - 1}$

B $f(x) = \frac{1}{x + 1}$

C $f(x) = \frac{1}{x^2 - 1}$

D $f(x) = \frac{1}{x^2 + 1}$

35.

What is the inverse of $f(x) = x + 1$?

A $f^{-1}(x) = -x - 1$

B $f^{-1}(x) = x - 1$

C $f^{-1}(x) = \frac{-1}{1 + x}$

D $f^{-1}(x) = \frac{1}{1 + x}$

36.

Which statement about graphs and their inverse is <u>true</u>?

A They are symmetric about $y = x$.

B They are symmetric about the origin.

C They are symmetric about the x-axis.

D They are symmetric about the y-axis.

37.

$f(x) = (x + 4)^2$

Which function is the inverse of $f(x)$?

A $f^{-1}(x) = \sqrt{x} - 4$

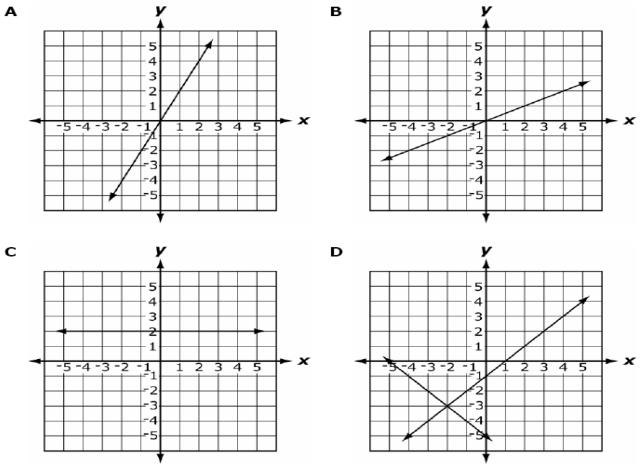
B $f^{-1}(x) = \frac{1}{(x + 4)^2}$

C $f^{-1}(x) = (x - 4)^2$

D $f^{-1}(x)$ is not a function.

38.

Which graph represents the inverse of $f(x) = 2x$?



39.

Profits, P, are equal to sales, S, minus expenses, E. If expenses are equal to travel, T, plus materials, M, which system of equations models this situation?

A $\begin{cases} P = S - E \\ E = T + M \end{cases}$

B $\begin{cases} P = S + E \\ E = T + M \end{cases}$

C $\begin{cases} P = S - E \\ E = T - M \end{cases}$

D $\begin{cases} P = S + E \\ E = T - M \end{cases}$

40

Tyrone spent no more than \$1,500 to buy a television and a DVD player. He spent at least 4 times as much for the television as for the DVD player. The television and the DVD player each cost at least \$100. Which system of inequalities models the amount of money Tyrone spent to buy the television, T, and the DVD player, D?

A $\begin{cases} T + D \geq 1{,}500 \\ T \geq 4D \\ T \geq 100 \\ D \geq 100 \end{cases}$

B $\begin{cases} 0 \leq T + D \leq 1{,}500 \\ D \geq 4T \\ T \geq 100 \\ D \geq 100 \end{cases}$

C $\begin{cases} 0 \leq T + D \leq 1{,}500 \\ T \geq 4D \\ T \geq 100 \\ D \geq 100 \end{cases}$

D $\begin{cases} T + D \geq 1{,}500 \\ D \geq 4T \\ T \geq 100 \\ D \geq 100 \end{cases}$

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41. The vertices of a triangle are (2, 1), (4, 4), and (6, 2). Which system of inequalities describes the interior of the triangle?

A $\begin{cases} 4y > x + 2 \\ 3y < 2x - 1 \\ y < 8 - x \end{cases}$

B $\begin{cases} 4y > x + 2 \\ 2y < 3x - 4 \\ y < 8 - x \end{cases}$

C $\begin{cases} 2y > x \\ 2y < 3x - 4 \\ y < 8 - x \end{cases}$

D $\begin{cases} 2y > x \\ 3y < 2x - 1 \\ y < 8 - x \end{cases}$

42. Meredith invests $50,000 in her new business. It costs the company $10 to produce each unit, which is sold for $15. Let C represent the cost and R represent the revenue for x units. Which statement is true about the graphs of the equations $C = 50{,}000 + 10x$ and $R = 15x$?

A Both slopes are positive.

B Both slopes are negative.

C One slope is positive, and the other is zero.

D One slope is negative, and the other is positive.

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

Which quadrants contain the solutions to this system of inequalities?

A quadrants I and IV

B quadrants II and III

C quadrants III and IV

D quadrants II, III, and IV

44. $\begin{cases} 3x - y + 5 = 0 \\ 2x + 3y - 4 = 0 \end{cases}$

What is the solution to this system of equations?

A $x = -1, y = -2$

B $x = -1, y = 2$

C $x = 2, y = -1$

D $x = 2, y = 1$

45. $\begin{cases} x + y = 5 \\ x + z = 7 \\ y + z = 16 \end{cases}$

What is the solution to this system of equations?

A $\{(2, 3, 9)\}$

B $\{(2, 7, 5)\}$

C $\{(-2, 8, 8)\}$

D $\{(-2, 7, 9)\}$

46. $\begin{cases} x^2 + y - 1 = 0 \\ x - y + 1 = 0 \end{cases}$

What is the solution set of this system of equations?

A $\{(-1, -1), (-1, 0)\}$

B $\{(-1, 0), (-1, 1)\}$

C $\{(-1, 0), (0, 1)\}$

D $\{(1, 0), (1, 1)\}$

47. $\begin{cases} y - x = 3 \\ x^2 - 7y + 31 = 0 \end{cases}$

What is the solution set of this system of equations?

A $\{(2, 5), (5, 2)\}$

B $\{(2, 5), (5, 8)\}$

C $\{(5, 8), (8, 5)\}$

D $\{(8, 5), (8, 8)\}$

48. $\begin{cases} x^2 - y = -3 \\ 2x^2 - y = -2 \end{cases}$

What is the solution set of this system of equations?

A $\{(-1, -4), (-1, 4)\}$

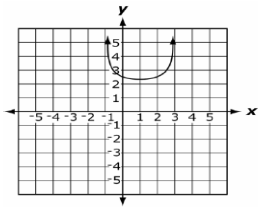
B $\{(-1, -4), (1, 4)\}$

C $\{(-1, 4), (1, -4)\}$

D $\{(-1, 4), (1, 4)\}$

Algebra II EOI Test Review

49.



How many real roots does the function given by this graph have?

A 0 real roots
B 1 real root
C 2 real roots
D 4 real roots

50.

Which equation has -1 and 3 as solutions?

A $x^2 - 2x - 3 = 0$

B $x^2 - 2x + 3 = 0$

C $x^2 + 2x - 3 = 0$

D $x^2 + 2x + 3 = 0$

51.

What number is added to both sides of the equation $x^2 - 8x + ___ = -3 + ___$ to solve it by completing the square?

A -16

B 16

C -64

D 64

52.

$$10x^2 - x - 3 = 0$$

What is the solution set of this equation?

A $\left\{\frac{-1}{2}, \frac{3}{5}\right\}$

B $\left\{\frac{-3}{5}, \frac{1}{2}\right\}$

C $\left\{\frac{-3}{2}, \frac{1}{5}\right\}$

D $\left\{\frac{-1}{5}, \frac{3}{2}\right\}$

53.

What are the solutions to $x^2 + 5x - 3 = 0$?

If $ax^2 + bx + c = 0$ and $a \neq 0$, then
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

A $\frac{-5 + \sqrt{13}}{2}$ or $\frac{-5 - \sqrt{13}}{2}$

B $\frac{-5 + \sqrt{37}}{2}$ or $\frac{-5 - \sqrt{37}}{2}$

C $\frac{5 + \sqrt{13}}{2}$ or $\frac{5 - \sqrt{13}}{2}$

D $\frac{5 + \sqrt{37}}{2}$ or $\frac{5 - \sqrt{37}}{2}$

54.

What is the y-intercept of $f(x) = 3x^2 - 2x + 1$?

A $(0, -1)$

B $(0, 1)$

C $(-1, 0)$

D $(1, 0)$

55.

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

In which direction does the graph of this parabola open?

A up

B left

C right

D down

56.

$$y = -4x^2 + 2x - 3$$

What is the y-intercept of the graph of this equation?

A -3

B 3

C -4

D 4

Algebra II EOI Test Review

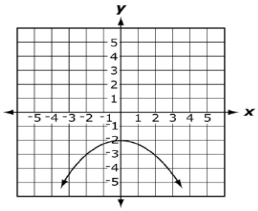
57. What are the coordinates at the minimum point of $f(x) = x^2 - 4x + 3$?

A $(-1, -2)$

B $(-1, 2)$

C $(2, -1)$

D $(2, 1)$

58. 

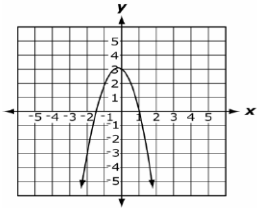
Which function represents this graph?

A $f(x) = -\frac{1}{4}x^2 - 2$

B $f(x) = \frac{1}{4}x^2 - 2$

C $f(x) = -4x^2 - 2$

D $f(x) = 4x^2 - 2$

59. 

Which function is represented by this graph?

A $f(x) = 2x^2 - x + 3$

B $f(x) = -2x^2 - x + 3$

C $f(x) = 2x^2 - 3x + 1$

D $f(x) = -2x^2 - 3x + 1$

60. $f(x) = x^2 - x + 6$

$g(x) = -3x^2 + 3x + 5$

Which statement best describes these two functions?

A They have no common points.

B They have the same x-intercepts.

C The maximum of $f(x)$ is the same as the minimum of $g(x)$.

D The maximum of $g(x)$ is the same as the minimum of $f(x)$.

61. $f(x) = x^2 - x + 4$

$g(x) = -3x^2 + 3x + 7$

Which statement best describes these two functions?

A The maximum of $f(x)$ is less than the minimum of $g(x)$.

B The minimum of $f(x)$ is less than the maximum of $g(x)$.

C The maximum of $f(x)$ is greater than the minimum of $g(x)$.

D The minimum of $f(x)$ is greater than the maximum of $g(x)$.

62. The length of a rectangular swimming pool is 20 feet greater than the width. The surface area of the pool is 1,500 square feet. What are the length and width of the pool?

A length = 20 ft, width = 20 ft

B length = 50 ft, width = 30 ft

C length = 60 ft, width = 40 ft

D length = 150 ft, width = 10 ft

63. A company is selling an item and determines that the profit from selling the item for a price of x dollars is given by the function below.

$$P(x) = -\frac{1}{4}(x - 16)^2 + 4$$

Which price will maximize the profit?

A $4

B $12

C $16

D $20

64. The path of a kicked soccer ball can be modeled by the function $f(x) = 26 + 2x - x^2$, where x is the horizontal distance (in meters) and $f(x)$ is the height (in meters). If the height is 2 meters, what is the horizontal distance?

A 4 meters

B 6 meters

C 12 meters

D 24 meters

Algebra II EOI Test Review

65. A landscape designer has to construct a rectangular flower bed with a perimeter of 100 feet and the maximum possible area. What is the area of the flower bed?

A 25 sq. ft

B 100 sq. ft

C 625 sq. ft

D 2,500 sq. ft

66. The profit, P, (in dollars) for Ace Car Rental is given by $P = 100x - 0.1x^2$, where x is the number of cars rented. How many cars have to be rented for the company to maximize profits?

A 500 cars

B 1,000 cars

C 12,500 cars

D 25,000 cars

67. The revenue, R, at a bowling alley is given by the equation $R = -\frac{1}{800}\left(x^2 - 2{,}400x\right)$, where x is the number of frames bowled. What is the maximum amount of revenue the bowling alley can generate?

A $800

B $1,200

C $1,800

D $2,400

68. Which best describes the graph of $\frac{x^2}{50} + \frac{y^2}{25} = 1$?

A circle

B ellipse

C parabola

D hyperbola

69. What is the equation of a circle with center $(-4, 2)$ and diameter 6?

A $(x - 4)^2 + (y + 2)^2 = 6$

B $(x + 4)^2 + (y - 2)^2 = 6$

C $(x - 4)^2 + (y + 2)^2 = 9$

D $(x + 4)^2 + (y - 2)^2 = 9$

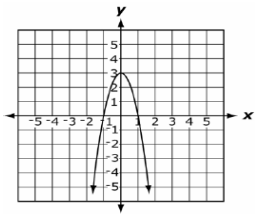
70. Which statement describes the equation $y = -x^2 + 6x - 8$?

A It is a vertical parabola.

B It is a vertical hyperbola.

C It is a horizontal parabola.

D It is a horizontal hyperbola.

71. 

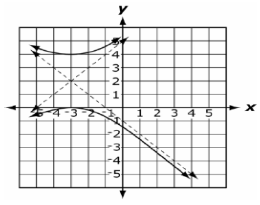
What is the equation of the given parabola?

A $y = -x^2 + 3$

B $y = -3x^2 + 3$

C $y = -x^2 - 2x + 3$

D $y = 3x^2 - 6x + 3$

72. 

What is the equation of the graphed hyperbola?

A $\frac{(x + 3)^2}{4} - \frac{(y - 2)^2}{4} = 1$

B $\frac{(y + 2)^2}{4} - \frac{(x - 3)^2}{4} = 1$

C $\frac{(y - 2)^2}{2} - \frac{(x + 3)^2}{2} = 1$

D $\frac{(y - 2)^2}{4} - \frac{(x + 3)^2}{4} = 1$

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73. What is the vertex of the parabola $y = (x - 1)^2 - 9$?

A $(-1, -9)$

B $(1, -9)$

C $(-9, -1)$

D $(-9, 1)$

74. What is the equation of the ellipse whose center is at the origin, major axis has length of 10 units along the x-axis, and minor axis has length of 6 units?

A $\frac{x^2}{25} + \frac{y^2}{9} = 1$

B $\frac{x^2}{9} + \frac{y^2}{25} = 1$

C $\frac{x^2}{20} + \frac{y^2}{12} = 1$

D $\frac{x^2}{100} + \frac{y^2}{36} = 1$

75.

x	0	1	2	3	4
y	1	3	9	27	81

Which function is best represented by the data in this table?

A $f(x) = x^3$

B $f(x) = 3^x$

C $f(x) = 3x$

D $f(x) = 3x^2$

76. $f(x) = 2^{-x} + 7$

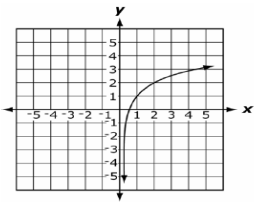
What are the horizontal asymptote and y-intercept for the graph of this function?

A Asymptote: $y = 7$, Intercept: $(0, 7)$

B Asymptote: $y = -7$, Intercept: $(0, 7)$

C Asymptote: $y = 7$, Intercept: $(0, 8)$

D Asymptote: $y = -7$, Intercept: $(0, 8)$

77. 

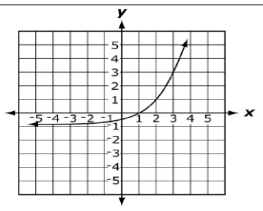
Which function is best represented by this graph?

A $f(x) = \log_2 x + 1$

B $f(x) = \log_2 x - 1$

C $f(x) = \log_2(x + 1)$

D $f(x) = \log_2(x - 1)$

78. 

Which function is best represented by this graph?

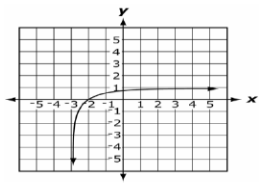
A $f(x) = 2^{x-1} - 1$

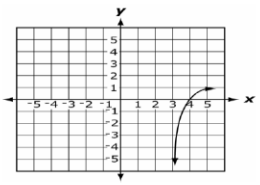
B $f(x) = 2^{x+1} - 1$

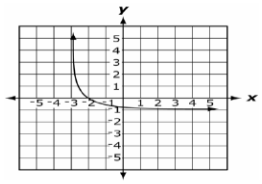
C $f(x) = 2^x - \frac{1}{2}$

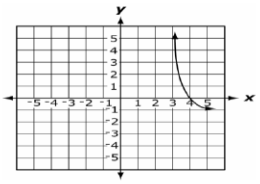
D $f(x) = 2^{x-1}$

79. Which graph represents the function $f(x) = \log(x + 3)$?

A 

B 

C 

D 

80. Which function is the inverse of $f(x) = \log x$?

A $f(x) = e^x$

B $f(x) = 2^x$

C $f(x) = 10^x$

D $f(x) = \frac{1}{\log x}$

Algebra II EOI Test Review

81. If $3^{\log_3 7} = x$, what is the value of x?

A 7

B 3^7

C $\sqrt[3]{7}$

D $\sqrt[7]{3}$

82. Which of these represents the solution for x in $6^x = 21$?

A $x = \frac{\log 6}{\log 21}$

B $x = \frac{\log 21}{\log 6}$

C $x = \log 21 - \log 6$

D $x = \log 21 + \log 6$

83. What is the value of $\log\sqrt{10}$?

A 0

B $\frac{1}{2}$

C 1

D 10

84. If $4\left(\log_3 \frac{1}{27}\right) = x$, what is the value of x?

A $\frac{4}{3}$

B $\frac{-4}{3}$

C 12

D -12

85. If $\log_{2x} 80 = 2$, what is the value of x?

A 20

B $2\sqrt{5}$

C $5\sqrt{2}$

D $2\sqrt{10}$

86. Loudness of fizz in a can of soda pop is represented by $F = 4\log\left(\frac{x}{10^{-5}}\right)$, where x is represented by the intensity of sound. How loud is the fizz, if $x = 10^{-3}$?

A 4 decibels

B 8 decibels

C 16 decibels

D 32 decibels

87. $$r = 2^{\left(\frac{1}{x}\right)} - 1$$

This formula gives the annual interest rate, r, required for your money to double in x years. If it takes 18 years for your money to double, what was the approximate annual interest rate?

A 2%

B 4%

C 8%

D 18%

88. The mass of a radioactive sample is given by $M(t) = M_0 10^{-kt}$, where t is the time in years, M_0 is the initial mass, and k is a constant. If 400 grams of this material decays to 40 grams in 10 years, what is the value of k?

A 1

B -1

C 0.1

D -0.1

89. $$f(x) = x^3 - 3x^2 - 4x + 12$$

Which of these is a root of $f(x)$?

A -3

B 3

C 4

D 12

90. $$2x^3 + 13x^2 + 17x - 12$$

Given that $(2x - 1)$ and $(x + 3)$ are factors of this polynomial, what is the third factor?

A $x - 4$

B $x + 4$

C $x - 6$

D $x + 6$

Algebra II EOI Test Review

91. **A rectangular prism has a volume of 120 cubic inches. The length of the prism is 5 inches, the width is $(x - 2)$ inches, and the height is $(x + 3)$ inches. What are the width and height of the prism?**

$V = Bh$

A width: 3 in., height: 8 in.

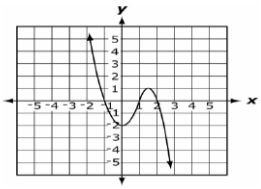
B width: 4 in., height: 6 in.

C width: 6 in., height: 4 in.

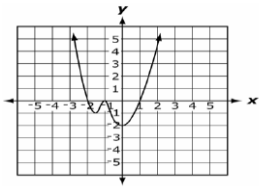
D width: 8 in., height: 3 in.

92. **What is the graph of the polynomial $y = x^3 + 2x^2 - x - 2$?**

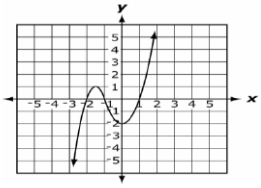
A



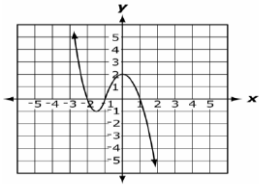
B



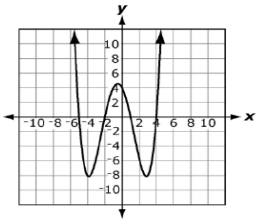
C



D



93.



Which equation is represented by this graph?

A $y = 0.1(x + 5)(x - 4)(x - 1)(x + 2)$

B $y = 0.1(x - 5)(x + 4)(x + 1)(x - 2)$

C $y = -0.1(x + 5)(x - 4)(x - 1)(x + 2)$

D $y = -0.1(x - 5)(x + 4)(x + 1)(x - 2)$

94. **Which statement describes the characteristics of the graph of $f(x) = -5x^4 + 3x^2 + x - 2$?**

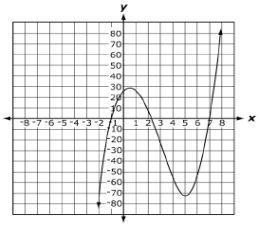
A The graph primarily increases in the third quadrant and increases in the first quadrant.

B The graph primarily decreases in the second quadrant and increases in the first quadrant.

C The graph primarily increases in the third quadrant and decreases in the fourth quadrant.

D The graph primarily decreases in the second quadrant and decreases in the fourth quadrant.

95.



What are the x- and y-intercepts of this graphed function?

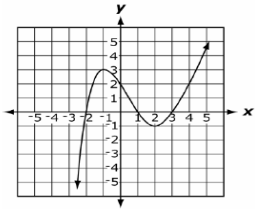
A x-intercepts: $(-1, 0)$, $(2, 0)$, $(7, 0)$; y-intercept: $(0, 28)$

B x-intercept: $(0, 28)$; y-intercepts: $(-1, 0)$, $(2, 0)$, $(7, 0)$

C x-intercepts: $(1, 0)$, $(-2, 0)$, $(-7, 0)$; y-intercept: $(0, 28)$

D x-intercept: $(0, 28)$; y-intercepts: $(1, 0)$, $(-2, 0)$, $(-7, 0)$

96.



What is the set of x-intercepts of this graphed function?

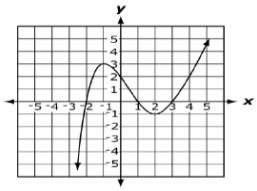
A $\{2\}$

B $\{-1, 2\}$

C $\{-1, 3\}$

D $\{-2, 1, 3\}$

97.



What is the set of approximate y-values of the relative minimum and maximum of this graphed function?

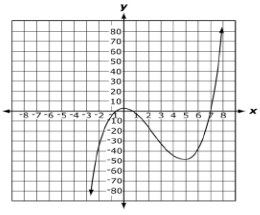
A $\{2\}$

B $\{-1, 2\}$

C $\{-1, 3\}$

D $\{-2, 1, 3\}$

98.



What are the properties of the point $(0, 3)$ in this graphed function?

A It is a relative minimum and an x-intercept.

B It is a relative maximum and an x-intercept.

C It is a relative minimum and a y-intercept.

D It is a relative maximum and a y-intercept.

Algebra II EOI Test Review

99. In a science fiction novel, a scientist proposes an equation that relates the distance (d) in meters between an object in space and a black hole and the time (t) in seconds the object will take to be pulled into the black hole.

$$d = 32t^4 + 16t^3 + 8t^2 + 4t$$

How far is the object from the black hole if the object will be pulled into the black hole in 10 seconds?

A 22,000 meters

B 336,840 meters

C 2,095,000 meters

D 2,431,800 meters

100. Two silos are each in the shape of a cylinder with a height of 60 feet and a radius r, and both are capped with a semispherical roof. The volume, V, in cubic feet of each silo is given by $V = \frac{2}{3}\pi r^3 + 60\pi r^2$. What is the difference between the volumes of a silo with a radius of 10 feet and a silo with a radius of 15 feet? (Use 3.14 for π.)

A 4,971.7 cubic feet

B 20,933.3 cubic feet

C 28,521.7 cubic feet

D 49,455.0 cubic feet

101. $$\frac{2}{x-1} = \frac{3}{x+1}$$

What is the value of x in this rational equation?

A 2

B 3

C 4

D 5

102. $$2x = \frac{4x+5}{3}$$

What is the value of x in this rational equation?

A -4

B -1

C $\frac{1}{2}$

D $\frac{5}{2}$

103. $$\frac{5}{2x-2} - \frac{9}{2x} = \frac{-1}{4}$$

What is the solution set of this rational equation?

A {6}

B {−3}

C {3, 6}

D {−3, −6}

104. $$\frac{-3}{x^2} + \frac{1}{2} = \frac{1}{2x}$$

What is the solution set of this rational equation?

A {−3, −2}

B {−3, 2}

C {−2, 3}

D {2, 3}

105. $$f(x) = \frac{1}{x+4}$$

What is the vertical asymptote of the graph of $f(x)$?

A $x = -4$

B $x = -1$

C $x = 1$

D $x = 4$

106. $$f(x) = \frac{4-x^2}{x}$$

What is the vertical asymptote of the graph of $f(x)$?

A $x = 4$

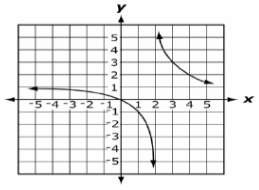
B $x = 2$

C $x = 0$

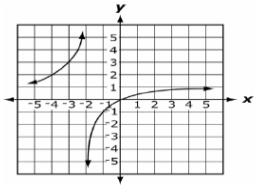
D $x = -2$

107. What is the graph of the function $f(x) = \frac{x}{x-2}$?

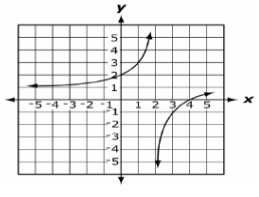
A



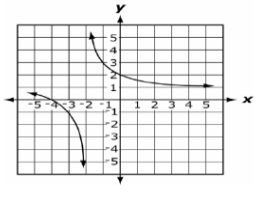
B



C



D



Algebra II EOI Test Review

108. $$y = \frac{x - 2}{x^2 + 4}$$

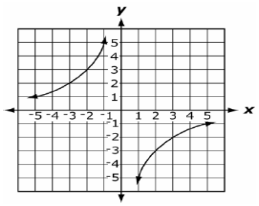
How many vertical asymptotes does the graph of this equation have?

A 0 vertical asymptotes

B 1 vertical asymptote

C 2 vertical asymptotes

D 4 vertical asymptotes

109. 

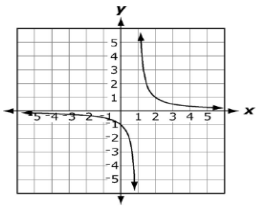
What is the horizontal asymptote of this graph?

A $x = 0$

B $y = 0$

C $x = 2.5$

D $y = 2.5$

110. 

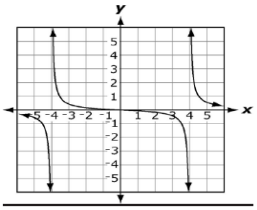
How many x-intercepts does the graph of this equation have?

A 0

B 1

C 2

D 4

111. 

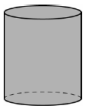
What are the asymptotes of this function?

A $x = \pm 4$, and $y = 0$

B $y = \pm 4$, and $x = 0$

C $x = \pm 4$

D $y = \pm 4$

112. 

If the surface area of the closed cylinder is 25 square inches, which equation represents the height of the cylinder in terms of r?

$$SA = 2\pi rh + 2\pi r^2$$

A $h = \frac{25 + 2\pi r^2}{2\pi r}$

B $h = \frac{25 - 2\pi r^2}{2\pi r}$

C $h = 25 + r$

D $h = 25 - r$

113. $$F = \frac{19(3 + 2t)}{1 + 0.05t}$$

A homeowner stocked his pond with fish. The number of fish, F, increases according to the above equation, where t is the time in years. What is the approximate number of fish after 10 years?

A 49 fish

B 69 fish

C 138 fish

D 291 fish

114. The intensity, L, of light varies inversely with the square of the distance, r, from the source of the light. Given that k is the constant of proportionality, which equation describes this relationship?

A $L = 2kr$

B $L = \frac{k}{r^2}$

C $L = k\sqrt{r}$

D $L = kr^2$

115. The cost, C, in dollars, to remove x percent of the trash left after a parade is modeled by the equation $C = \frac{450x}{225 - x}$. Approximately what percent of trash will be removed if \$100 is spent?

A 41%

B 50%

C 59%

D 64%

Algebra II EOI Test Review

116. Nancy made a scatter plot of how much money she had left at the end of each day of her vacation.



Which table best represents the data in her scatter plot?

A

Day	1	2	3	4	5
Money	$100	$100	$100	$100	$100

B

Day	1	2	3	4	5
Money	$100	$200	$300	$400	$500

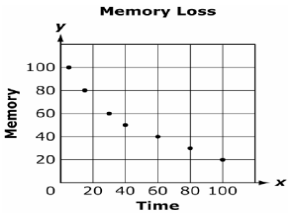
C

Day	1	2	3	4	5
Money	$500	$200	$300	$400	$100

D

Day	1	2	3	4	5
Money	$500	$400	$300	$200	$100

117.



Which set of data best represents the data on the scatter plot?

A

Time	10	30	60	80	100
Memory	95	60	40	30	20

B

Time	10	30	60	80	100
Memory	20	30	40	60	95

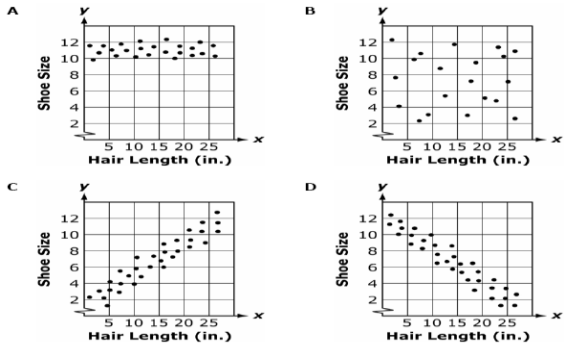
C

Time	10	30	60	80	100
Memory	100	80	60	40	20

D

Time	10	30	60	80	100
Memory	85	60	50	40	20

118. There is no correlation between a person's hair length and shoe size. Which scatter plot best represents this situation?



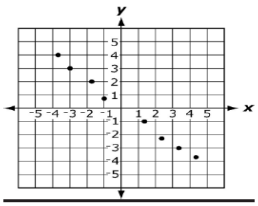
119. The test scores and hours studied of 6 students were put into a scatter plot.



If another student studies 2 hours, what is the most likely test score based on the curve of best fit?

A 20
B 60
C 70
D 80

120.



Which equation most closely models the data in the scatter plot?

A $y = x$
B $y = -x$
C $y = 2x$
D $y = -2x$

121.

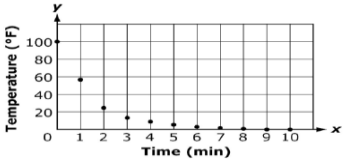
Growth vs. Time

Time	Growth
2	1
4	2
5	3.5
6	6
6.5	8.5

Which type of function best models the data in this scatter plot?

A exponential
B logarithmic
C quadratic
D linear

122. Students in a science classroom perform an experiment to find the rate at which a hot liquid cools in a freezer. They plot the temperature over time and obtain the following graph.

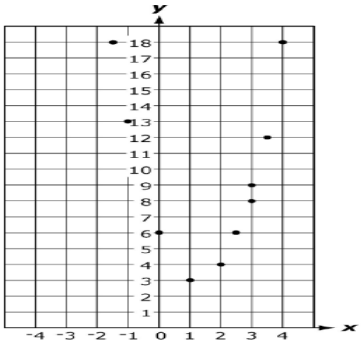


Which type of function best models the data in this scatter plot?

A exponential
B logarithmic
C quadratic
D linear

123. Which equation most closely models the data in the scatter plot?

A $y = x^2 - 4x + 6$
B $y = -x^2 - 2x + 6$
C $y = -2x^2 - x + 6$
D $y = 2x^2 - 5x + 6$



Algebra II EOI Test Review

124. Which of these observations would be consistent with an exponential model of population growth?

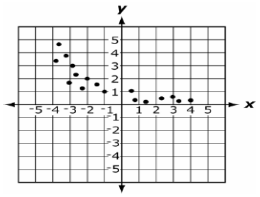
A The population started out large, decreased in size, then became large again.

B The population is observed to increase at a faster rate as time passes.

C The population is observed to increase steadily over time.

D The population grew very quickly but then declined.

125.



Which equation best models the data in this scatter plot?

A $y = 5(0.5^x)$

B $y = -5(5^x)$

C $y = 0.5(0.5^x)$

D $y = -0.5(5^x)$

126-131 Use these equations

Arithmetic Sequences & Series

n^{th} term: $a_n = a_1 + (n-1)d$

Sum: $s_n = \frac{n}{2}(a_1 + a_n)$

Geometric Sequences & Series

n^{th} term: $a_n = a_1 r^{(n-1)}$

Sum: $s_n = \frac{a_1(1-r^n)}{(1-r)}$

126. $\{1, 3, 5, 7, \ldots\}$

What is the 12^{th} term in this sequence?

A 22

B 23

C 24

D 25

127. $2 + 10 + 50 + \ldots$

What is the sum of the first 6 terms of this series?

A 3,906

B 7,812

C 15,624

D 31,248

128. A child puts $1.00 into a piggy bank. One week later, he puts $1.25 in the bank. Two weeks later, he puts $1.50 in the bank, and so on. How much money does he put in the bank on the 25th week?

A $6.75

B $7.00

C $93.00

D $100.00

129. What is the value of x in the geometric sequence $\left(x, \frac{-1}{2}, \frac{1}{8}, \frac{-1}{32}, \ldots\right)$?

A -4

B -2

C 2

D $\frac{9}{2}$

130. In an arithmetic sequence beginning with 36 and ending with 405, how many integers are divisible by 9?

A 41 integers

B 42 integers

C 44 integers

D 45 integers

131 How many terms are there in a geometric series if the first term is 3, the common ratio is 4, and the sum of the series is 1,023?

A 4 terms

B 5 terms

C 6 terms

D 23 terms