Algebra II Practice Test

Objective: 1.1a

1. Which is equivalent to $49^{\frac{3}{2}}$?
   A 21
   B 98
   C 294
   D 343

2. Which expression is another way to write $\sqrt[3]{125x^4}$?
   A $5x^{\frac{3}{4}}$
   B $5x^{\frac{4}{3}}$
   C $25x^{\frac{3}{4}}$
   D $25x^{\frac{4}{3}}$

3. If x and y are real numbers, what is the simplified radical form of $\left(x^2y^5\right)^{\frac{1}{5}}$?
   A $y\sqrt[5]{x^2}$
   B $y\sqrt{x^5}$
   C $|y|\sqrt[5]{x^2}$
   D $|y|\sqrt{x^5}$

Objective 1.1b

4. What is the simplified expression of $\sqrt{\frac{36x^8}{4x^6}}$?
   A $3x$
   B $9x$
   C $3x^2$
   D $9x^2$

5. What is the simplified form of $\left(2\sqrt{5}+3\right)\left(\sqrt{5}-1\right)$?
   A $\sqrt{5}-3$
   B $\sqrt{5}+7$
   C $2\sqrt{5}-3$
   D $2\sqrt{5}+7$

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 $2\sqrt{2}+1$

Objective 1.2a

8. Which expression represents the quotient? $\frac{8x^6z^4+4x^4z^2}{4x^2z}$

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

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

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

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

9. Which expression represents the quotient? $\frac{4x^2y}{8xy^2}\div\frac{12xy^2}{8x^6y^3}$

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

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

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

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

10. Which expression represents the quotient? $\left(y^2-4y-32\right)\div(y+4)$

A $y-8$

B $y+8$

C $y-4$

D $y+4$

11. 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?

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

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

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

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

objective 1.2b

12. What is the completely simplified equivalent of $\frac{x^2+x-12}{x^2-6x+9}$?

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

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

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

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

13. Which expression represents the result of this subtraction $\frac{3x-1}{x+2}-\frac{x-2}{x-1}$?

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

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

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

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

14. What is the simplified equivalent of $2-x-\frac{1}{3-x}$?

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

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

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

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

objective 1.3b

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

    A $-12i$
    B $12i$
    C $-64i$
    D $64i$

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

    A (3 − 4*i*) amps
    B (3 + 4*i*) amps
    C (3 − 10*i*) amps
    D (3 + 10*i*) amps

17. 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 $-2\sqrt{6}-3i\sqrt{2}$

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

    A $-2-23i$
    B $-2+7i$
    C $22-23i$
    D $22+7i$

19. What is the completely simplified equivalent of $\frac{2}{5+i}$?

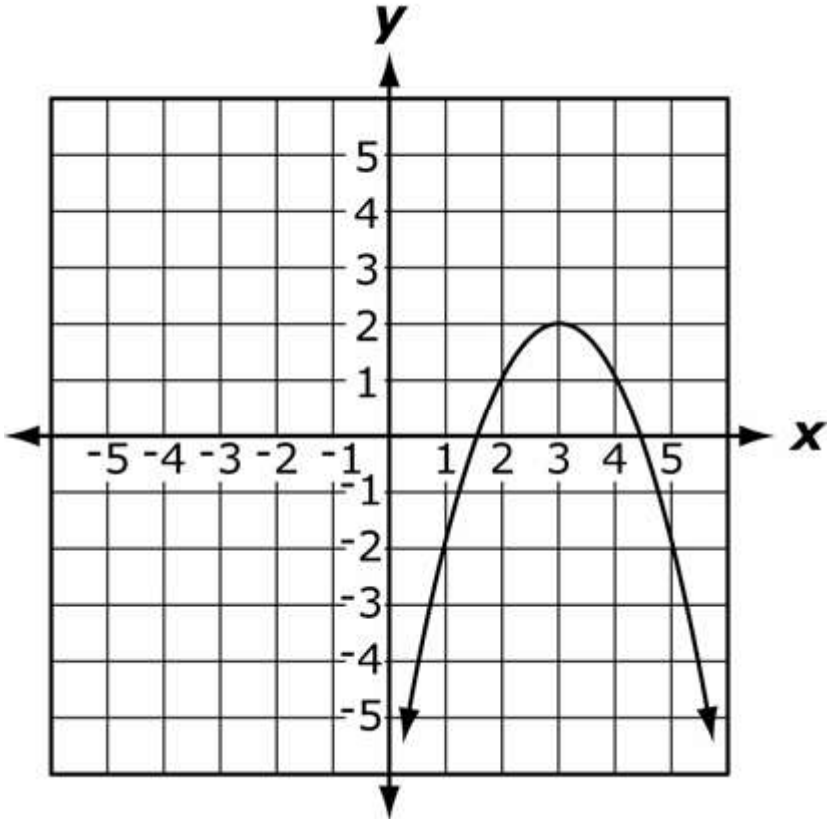
    A $\frac{5-i}{12}$
    B $\frac{5+i}{12}$
    C $\frac{5-i}{13}$
    D $\frac{5+i}{13}$

objective 2.1a

20. What is the parent graph of the following function and what transformations have taken place on it: $y=(x-3)^2$?

    A The parent graph is $y=x^2$, which is shifted 3 units up.
    B The parent graph is $y=x^2$, which is shifted 3 units down.
    C The parent graph is $y=x^2$, which is shifted 3 units to the left.
    D The parent graph is $y=x^2$, which is shifted 3 units to the right.

21. What is the parent function of this graph?



A $f(x)=x^2$

B $f(x)=x^4$

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

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

objective 2.1b

22. 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

23. If $f(x)=x^2-1$ and $g(x)=x-1$, what is the value of $\left(\frac{f}{g}\right)(x)$?

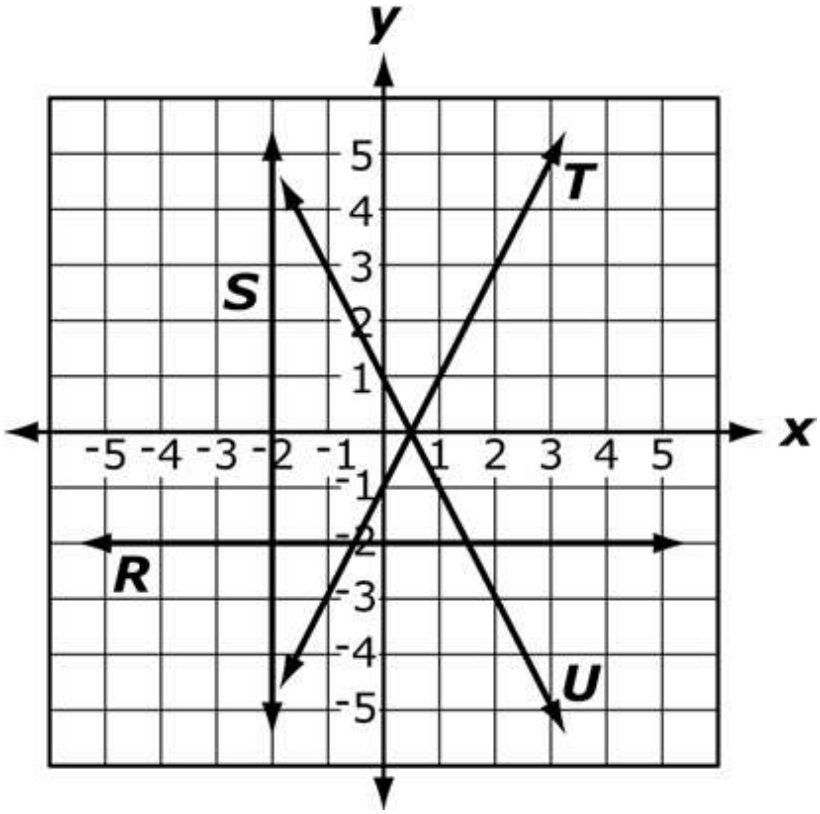
A $x-1$

B $x+1$

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

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

24.



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

A line R
B line S
C line T
D line U

Objective 2.1c

25. If $f(x)=2x+7$ and $g(x)=3x^2-1$, what expression represents $(f(g(x))$?

A $6x^2+5$
B $6x^2+12$
C $3x^2-2x-8$
D $3x^2+2x+6$

26. 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 $g(x)=(x-1)$

Objective 2.1d

27. Which statement is true 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.

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

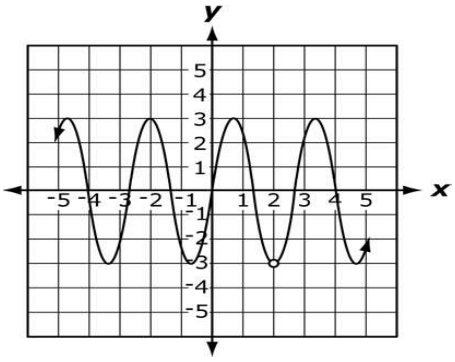
A $\{x : x \neq 0\}$
B $\{x : x \neq -5\}$
C $\{x : x \neq -2, 4\}$
D $\{x : x \neq 2, -4\}$

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

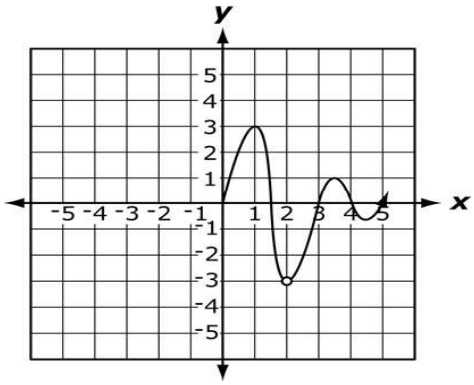
A $(-\infty, 4)$ and $(4, \infty)$
B $(-\infty, -4)$ and $(4, \infty)$
C $(-\infty, -4)$ and $(-4, \infty)$
D $(-\infty, -4)$ and $(-2, \infty)$

30. Domain: $\{x|x \geq 0, x \neq 2\}$ Range: $\{y|-3 < y \leq 3\}$ Which graph corresponds to the given constraints?

A



B



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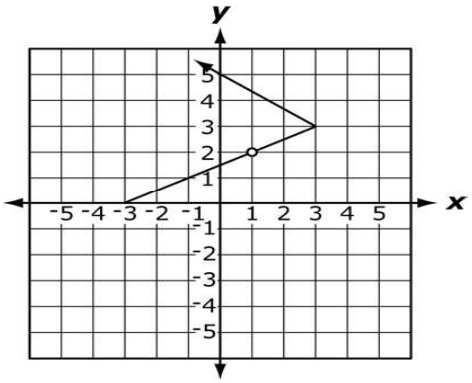

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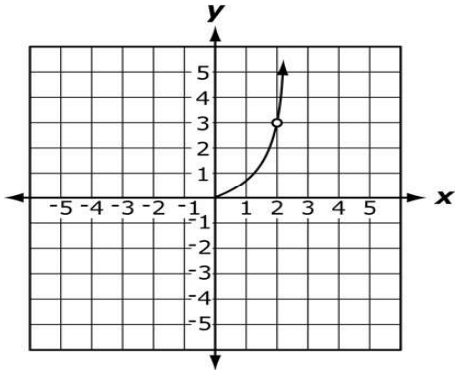


31. Which function has the fewest domain restrictions for real numbers?

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

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

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

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

Objective 2.1e

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

33. What is the inverse of the function $f(x)=(x+4)^2$?

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

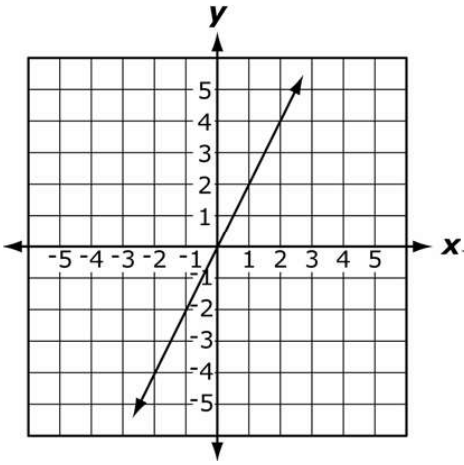
B $f^{-1}(x)=\dfrac{1}{(x+4)^2}$

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

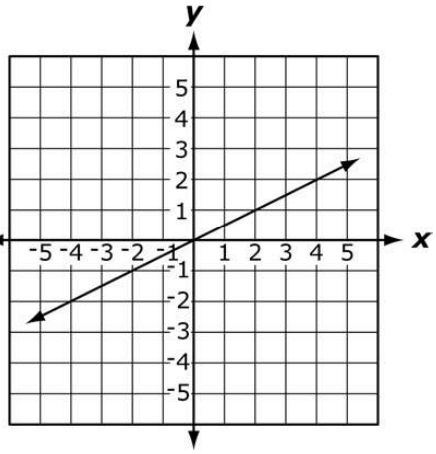
D $f^{-1}(x)=(x-4)^2$

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

A



B



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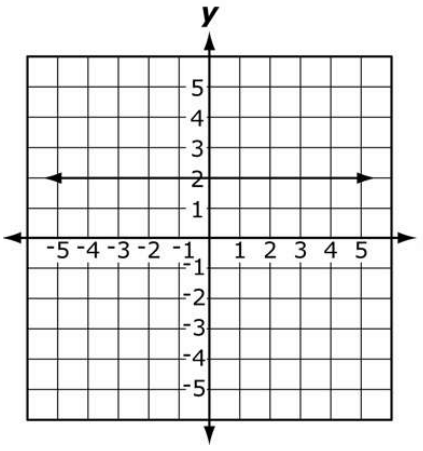

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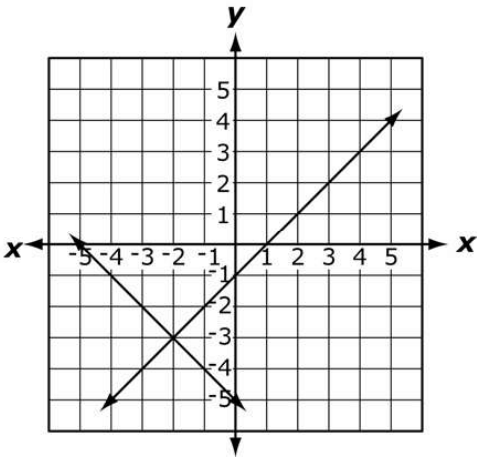


35. Which statement about graphs and their inverse is true?

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.

Objective 2.2a

36. 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 $\begin{aligned} P &= S - E \\ E &= T + M \end{aligned}$

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

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

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

37. Tyrone wants to spend at most $10,000 on two televisions, *R* and *S*. Each television must cost at least $3,000, and television *R* must cost at least twice as much as television *S*. Which system of inequalities models the amount of money spent on each television?

A $\begin{aligned} R + S &\geq 10,000 \\ R &\geq 2S \\ R &\geq 3,000 \\ S &\geq 3,000 \end{aligned}$

B $\begin{aligned} R + S &\leq 10,000 \\ S &\geq 2R \\ R &\geq 3,000 \\ S &\geq 3,000 \end{aligned}$

C $\begin{aligned} R + S &\leq 10,000 \\ R &\geq 2S \\ R &\geq 3,000 \\ S &\geq 3,000 \end{aligned}$

D $\begin{aligned} R + S &\geq 10,000 \\ S &\geq 2R \\ R &\geq 3,000 \\ S &\geq 3,000 \end{aligned}$

38. 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.

Objective 2.2b

39. Which quadrants contain the solutions to this system of inequalities?

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

A quadrants I and IV
B quadrants II and III
C quadrants III and IV
D quadrants II, III, and IV

40. What is the solution to this system of equations? $\left\{\begin{matrix}3x-y+5=0\\2x+3y-4=0\end{matrix}\right\}$

A $x=-1, y=-2$
B $x=-1, y=2$
C $x=2, y=-1$
D $x=2, y=1$

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

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

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

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

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

Objective 2.2c

42. What is the solution set of this system of equations?

$$\left\{\begin{matrix}x^2+y-1=0\\x-y+1=0\end{matrix}\right\}$$

A $\{(-1,-1),(-1,0)\}$
B $\{(-1,0),(-1,1)\}$
C $\{(-1,0),(0,1)\}$
D $\{(1,0),(1,1)\}$

43. What is the solution set of this system of equations?

$$\left\{\begin{matrix}y-x=3\\x^2-7y+31=0\end{matrix}\right\}$$

A $\{(2,5),(5,2)\}$
B $\{(2,5),(5,8)\}$
C $\{(5,8),(8,5)\}$
D $\{(8,5),(8,8)\}$

44. What is the solution set of this system of equations?

$$\left\{\begin{matrix} x^2 - y = -3 \\ 2x^2 - y = -2 \end{matrix}\right\}$$

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

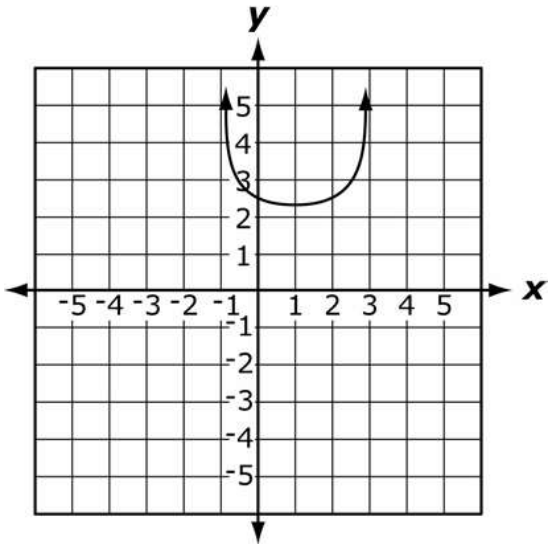
B $\{(-1,-4),(1,4)\}$

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

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

Objective 2.3a

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



A 0 real roots

B 1 real root

C 2 real roots

D 4 real roots

46. What number is added to both sides of the equation $x^2 - 8x + 3 = 0$ to solve it by completing the square?

A -16

B 16

C -64

D 64

47. What is the solution of $x^2+5x-3=0$?

A $\frac{-5\pm\sqrt{13}}{2}$

B $\frac{-5\pm\sqrt{37}}{2}$

C $\frac{5\pm\sqrt{13}}{2}$

D $\frac{5\pm\sqrt{37}}{2}$

Objective 2.3b

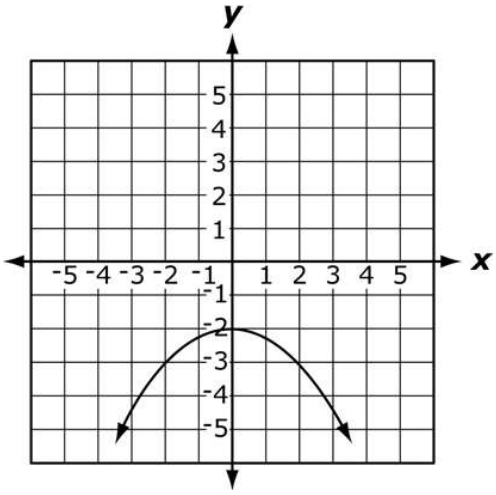
48. What is the y-intercept of $f(x)=3x^2-2x+1$?

A (0, -1)
B (0, 1)
C (-1, 0)
D (1, 0)

49. 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)

50. 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 $f(x)=4x^2-2$

51. Which statement best describes these two functions?

$$f(x) = x^2 - x + 6$$
$$g(x) = -3x^2 + 3x + 5$$

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).*

52. Which statement best describes these two functions?

$$f(x) = x^2 - x + 4$$
$$g(x) = -3x^2 + 3x + 7$$

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).*

Objective 2.3c

53. 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

54. 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

55. The revenue, R, at a bowing 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

Objective 2.4

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

A circle
B ellipse
C parabola
D hyperbola

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

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

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

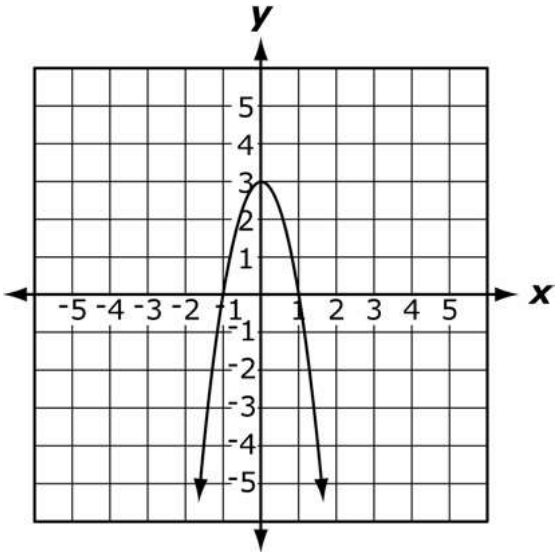
C $(x-4)^2+(y+2)^2=9$

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

58. 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.

59. What is the equation of the given parabola?



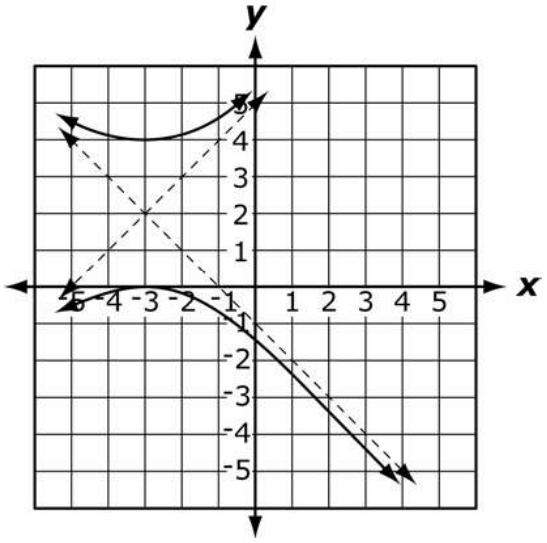
A $y=-x^2+3$

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

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

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

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

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

A (-1, -9)
B (1, -9)
C (-9, -1)
D (-9, 1)

62. 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?

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$$

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

Objective 2.5a

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

X	0	1	2	3	4
Y	1	3	9	27	81

A $f(x) = x^3$

B $f(x) = 3^x$

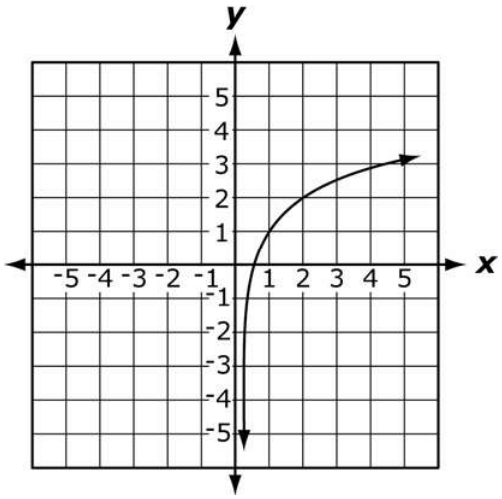
C $f(x) = 3x$

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

64. What are the horizontal asymptote and y-intercept for the graph of this function $f(x) = 2^{-x} + 7$?

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)

65. Which function is best represented by this graph?



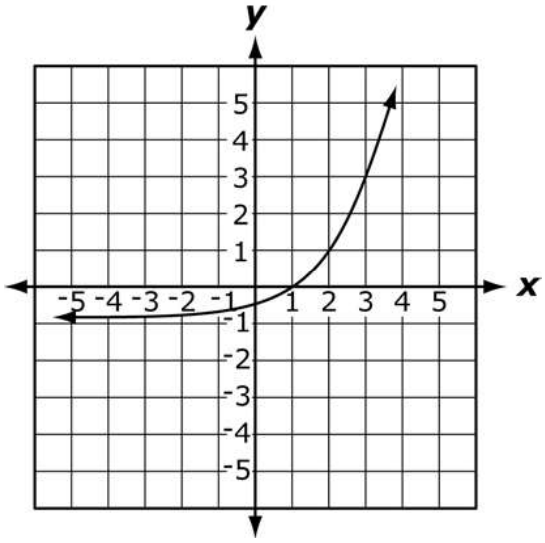
A $f(x) = \log_2 x + 1$

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

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

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

66. Which function is best represented by this graph?



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

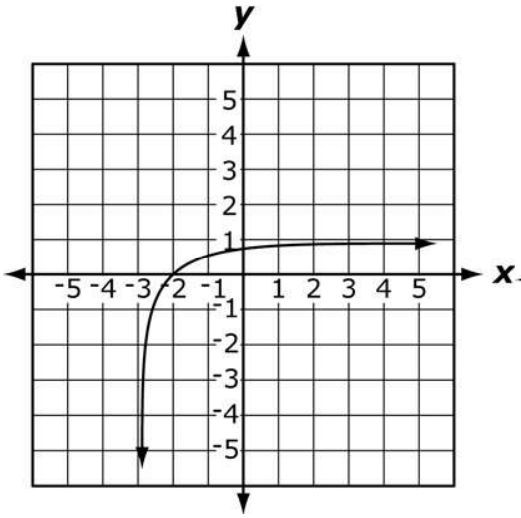
B $f(x) = 2^{x+1} - 1$

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

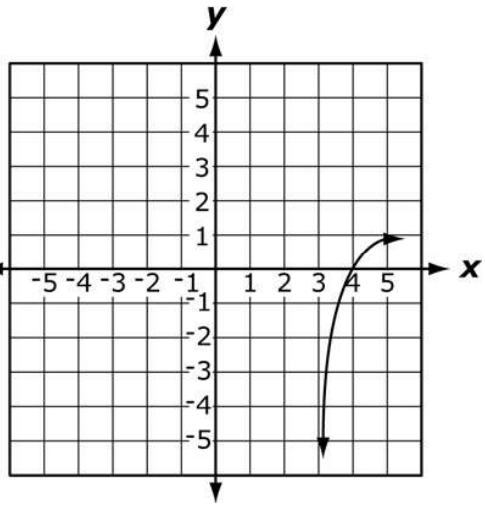
D $f(x) = 2^{x-1}$

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

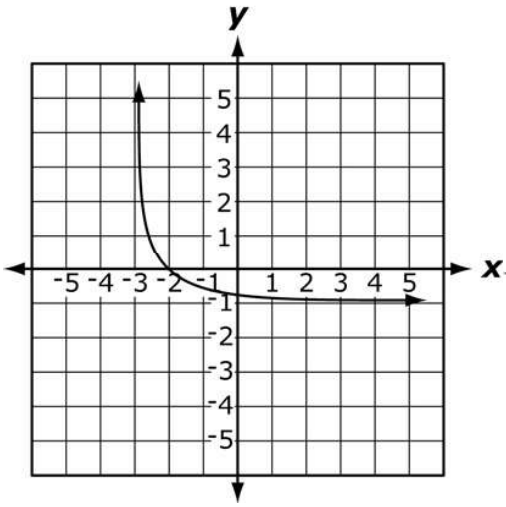
A



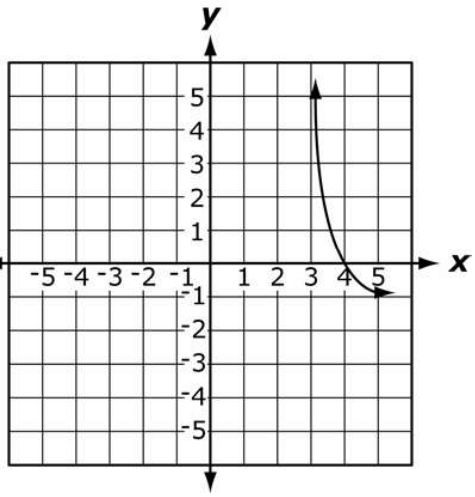
B



C



D



objective 2.5b

68. 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 $f(x) = \dfrac{1}{\log x}$

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

A 7

B 3^7

C $\sqrt[3]{7}$

D $\sqrt[7]{3}$

70. Which equation represents the solution for x in the formula $6^x = 21$?

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

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

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

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

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

A 0

B ½

C 1

D 10

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

A 20

B $2\sqrt{5}$

C $5\sqrt{2}$

D $2\sqrt{10}$

73. 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

Objective: 2.5c

74. If the 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

75. The formula, $r = 2^{\frac{1}{x}} - 1$, 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%

76. The population, *P*, of prairie dogs increases according to the equation $P = 2{,}250e^{rt}$, where *t* is the number of years, and *r* is the rate of growth. Which equation solves for *r*?

A $r = \dfrac{\ln\left(\dfrac{P}{2{,}250}\right)}{t}$

B $r = \dfrac{t}{\ln\left(\dfrac{P}{2{,}250}\right)}$

C $r = \dfrac{\ln\left(\dfrac{2{,}250}{P}\right)}{t}$

D $r = \dfrac{t}{\ln\left(\dfrac{2{,}250}{P}\right)}$

77. 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

Objective 2.6a

78. 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 $x^2 + 2x + 3 = 0$

79. Which of these is a root of $f(x)=x^3-3x^2-4x+12$?

A -3
B 3
C 4
D 12

80. Given that $(2x-1)$ and $(x+3)$ are factors of the polynomial, $2x^3+13x^2+17x-12$, what is the third factor?

A x-4
B x+4
C 3-x
D 3+x

81. What is the solution set of $10x^2-x-3=0$?

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

82. 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?

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.

83. 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 $(3x^3-30x^2+160x-849)$

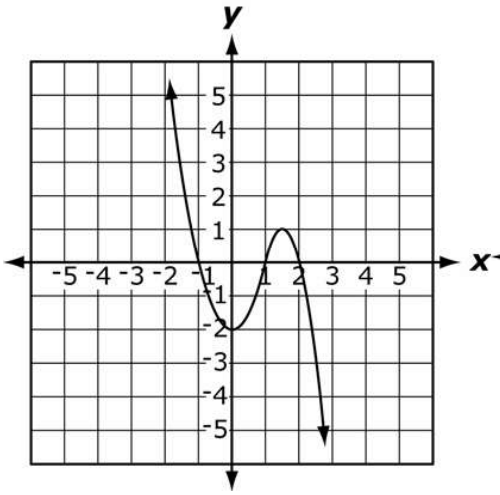
Objective 2.6b

84. In which direction does the graph of the parabola $x = -y^2$ open?

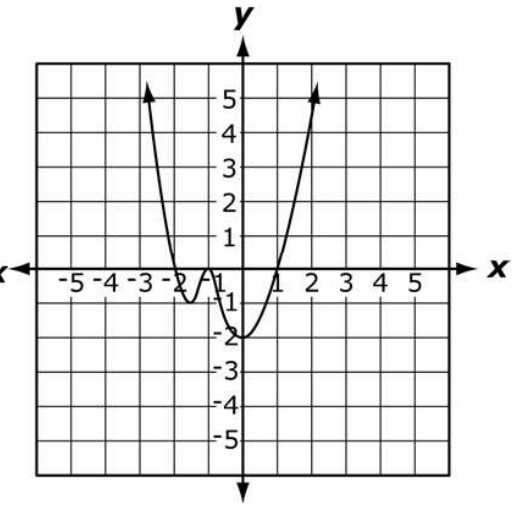
A up
B left
C right
D down

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

A



B



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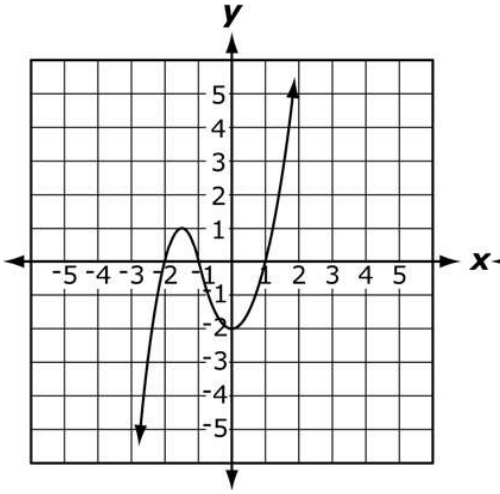
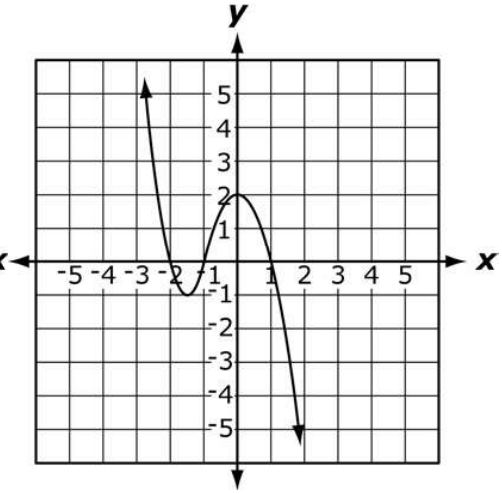
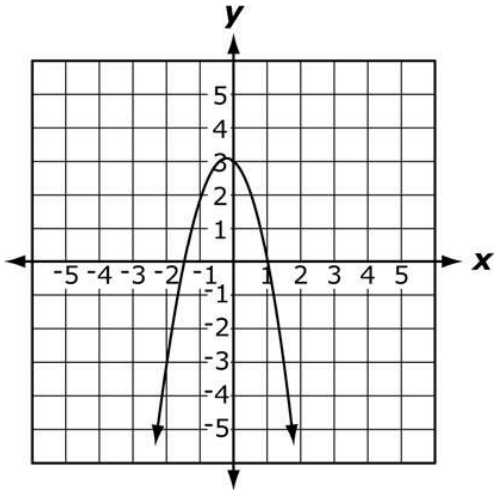


D



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

87. 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.

Objective 2.6c

88. What is the y-intercept of the graph of $y = -4x^2 + 2x - 3$?

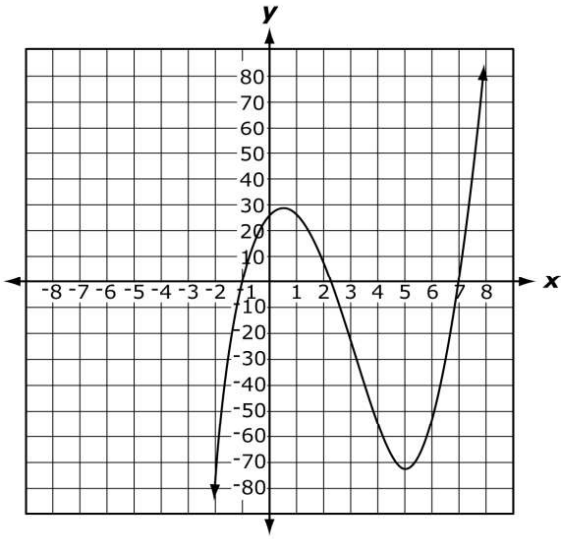
A -3

B 3

C -4

D 4

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



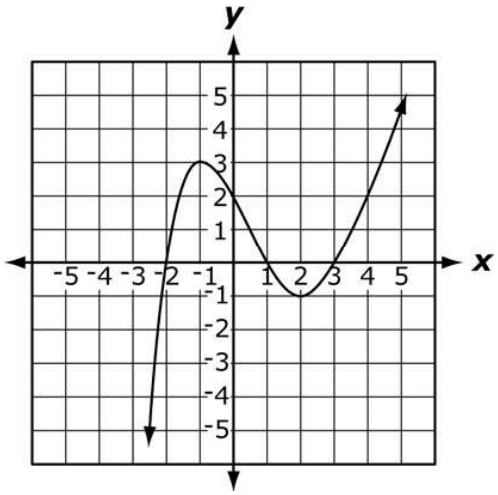
A x-intercepts: (-1, 0), (2.3, 0), (7, 0); y-intercepts: (0, 28)

B x-intercepts: (-0, 28); y-intercepts: (-1, 0), (2.3, 0), (7, 0)

C x-intercepts: (1, 0), (-2.3, 0), (-7, 0); y-intercepts: (0, 28)

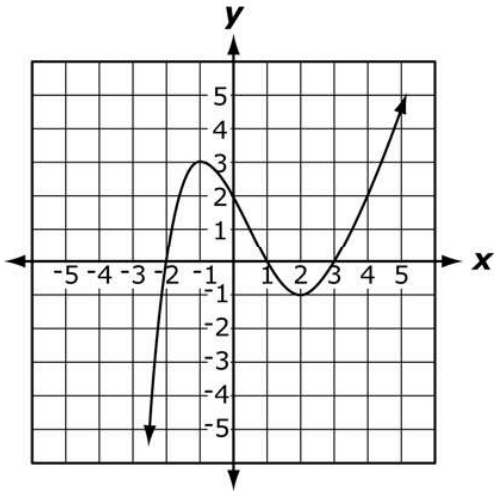
D x-intercepts: (0, 28); y-intercepts: (1, 0), (-2.3, 0), (-7, 0)

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



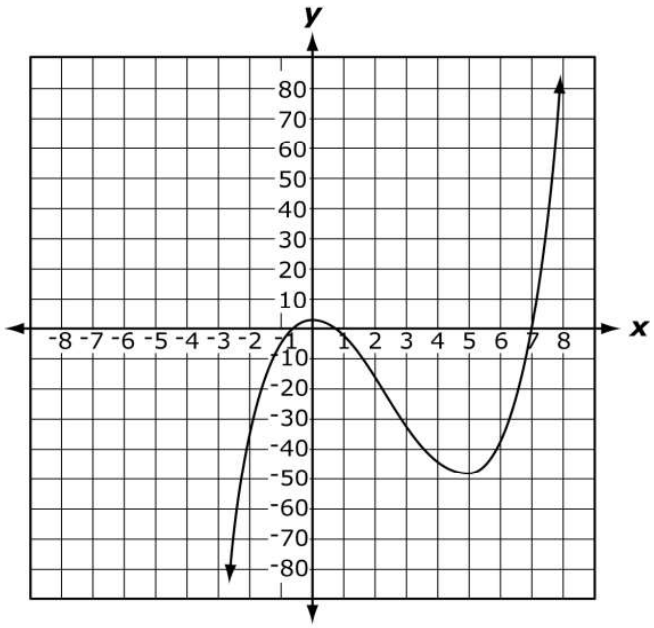
A {2}
B {-1, 2}
C {-1, 3}
D {-2, 1, 3}

91. 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}

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

Objective 2.6

93. 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 $L = kr^2$

94. 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

95. 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

96. 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

Objective 2.7a

97. What is the value of *x* in this rational equation $\frac{2}{x-1} = \frac{3}{x+1}$?

A 2

B 3

C 4

D 5

98. What is the solution set of this rational equation $\frac{5}{2x-2}-\frac{9}{2x}=\frac{-1}{4}$?

A {6}
B {-3}
C {3, 6}
D {-3, -6}

99. What is the value of x in this rational equation $2x=\frac{4x+5}{3}$?

A -4
B -1
C $\frac{1}{2}$
D $\frac{5}{2}$

100. What is the solution set of this rational equation $\frac{-3}{x^2}+\frac{1}{2}=\frac{1}{2x}$?

A {-3,-2}
B {-3, 2}
C {-2, 3}
D {2, 3}

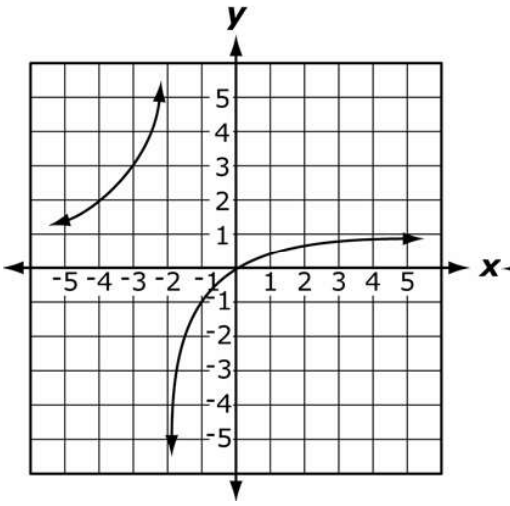
Objective 2.7b

101. What is the vertical asymptote of the graph of $f(x)=\frac{1}{x+4}$?

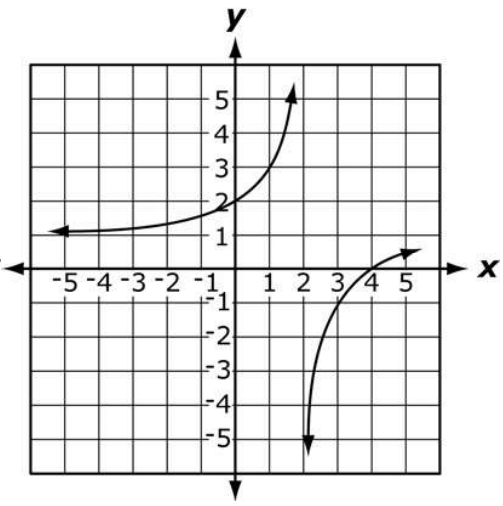
A $x=-4$
B $x=-1$
C $x=1$
D $x=4$

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

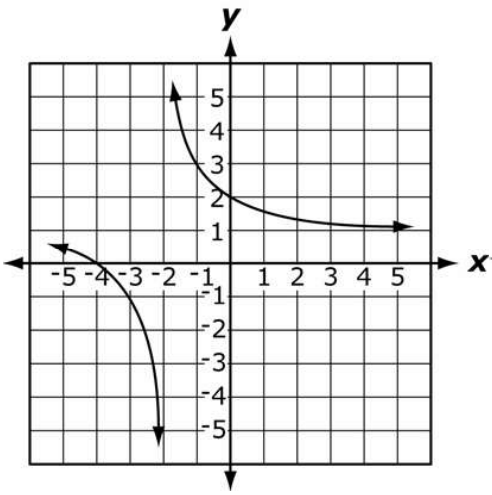
A



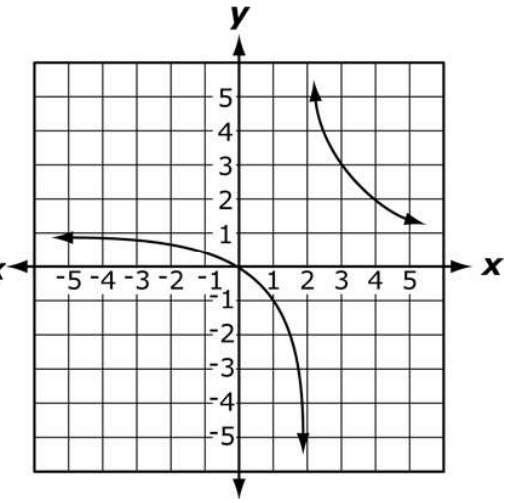
B



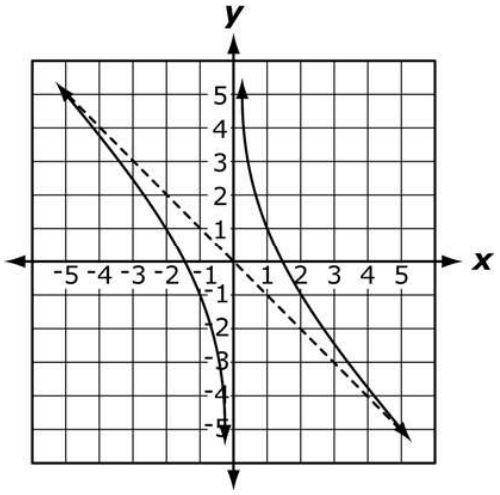
C



D



103. Which function is represented by this graph?



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

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

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

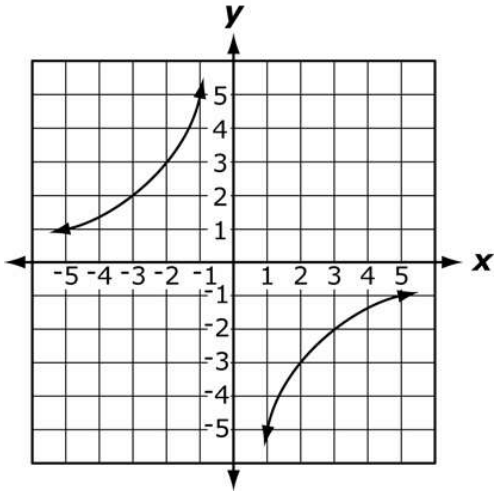
D $f(x)=\frac{2+x^2}{x}$

104. How many vertical asymptotes does the graph of $y=\frac{x-2}{x^2+4}$ have?

A 0 vertical asymptotes
B 1 vertical asymptote
C 2 vertical asymptotes
D 4 vertical asymptotes

0bjective 2.7c

105. What is the horizontal asymptote of this graph?



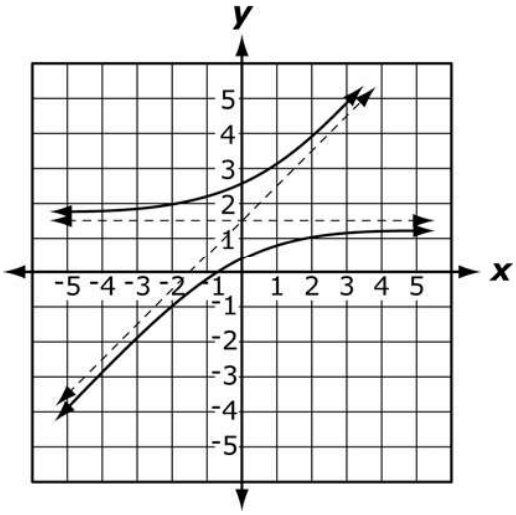
A $x = 0$

B $y = 0$

C $x = 2.5$

D $y = 2.5$

106. Which statement correctly describes the asymptotes of the graph of this rational function?



A The vertical asymptote is $x = \frac{3}{2}$, and there is a negative slant asymptote.

B The vertical asymptote is $y = \frac{3}{2}$, and there is a negative slant asymptote.

C The horizontal asymptote is $x = \frac{3}{2}$, and there is a positive slant asymptote.

D The horizontal asymptote is $y = \frac{3}{2}$, and there is a positive slant asymptote.

107. How many x-intercepts does the graph of $y = \frac{x+1}{x^2-1}$ have?

A 0
B 1
C 2
D 4

108. What are the vertical and horizontal asymptotes of $f(x) = \frac{x^2-9}{16-x^2}$?

A $x = \pm 4, \text{ and } y = -1$
B $y = \pm 4, \text{ and } x = -1$
C $x = \pm 4, \text{ and } y = 1$
D $y = \pm 4, \text{ and } x = 1$

Objective 2.7d

109. If the surface area of a closed cylinder is 25 square inches, which equation represents the height of the cylinder in terms of *r*? $\left(SA = 2\pi rh + 2\pi r^2\right)$

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 $h = 25 - r$

110. A homeowner stocked his pond with fish. The number of fish, *F*, increases according to the equation, $F = \frac{19(3+2t)}{1+0.05t}$, where *t* is the time in years. What is the approximate number of fish after 10 years?

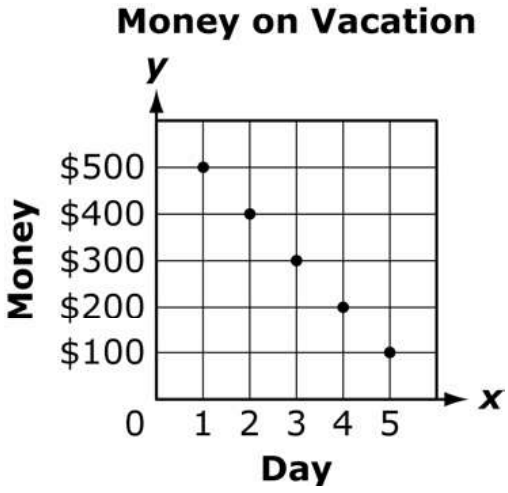
A 49 fish
B 69 fish
C 138 fish
D 291 fish

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

A 41%
B 50%
C 59%
D 64%

Objective 3.1a

112. 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

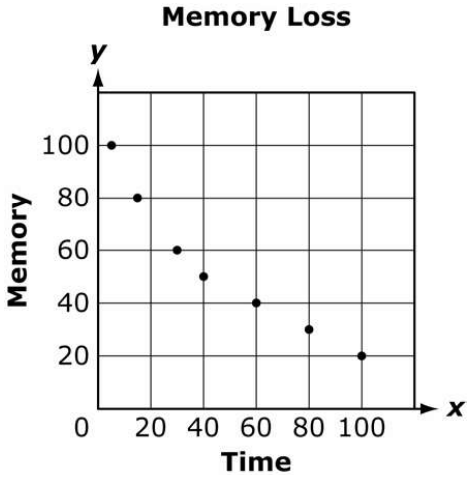
C

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

113. 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

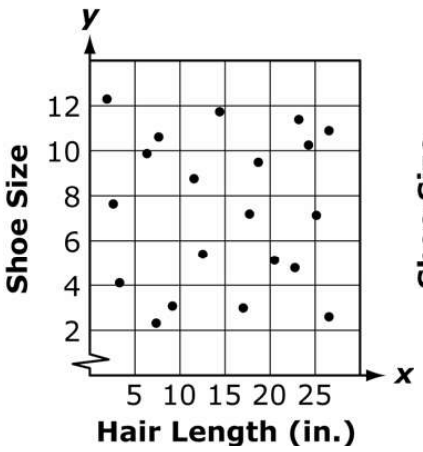
Time	10	30	60	80	100
Memory	100	80	60	40	20

D

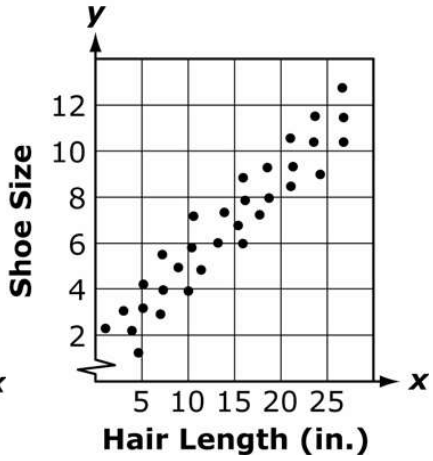
Time	10	30	60	80	100
Memory	85	60	50	40	20

114. Which scatter plot best represents the lack of correlation between shoe size and hair length?

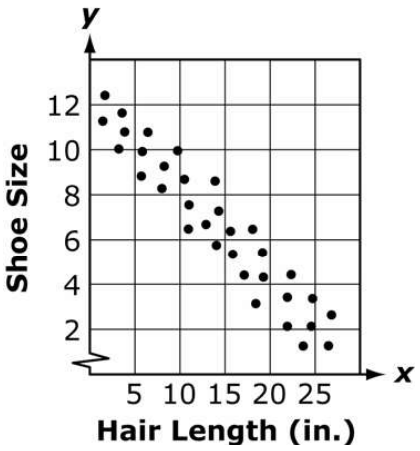
A



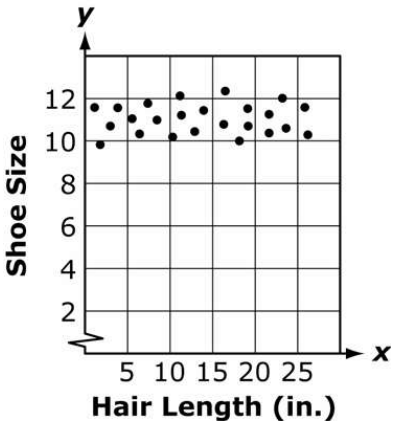
B



C

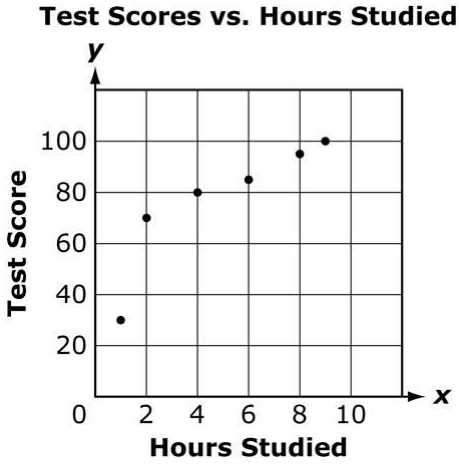


D



objective 3.1b

115. 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 this data?

A 20
B 60
C 70
D 80

116. 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.

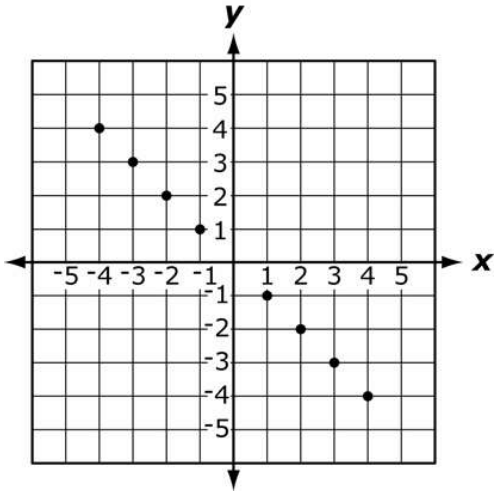
B The population is observed to increase at a faster rate as time passes.

C The population is observed to increase steadily over time.

D The population grew very quickly but then declined.

Objective 3.1c

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



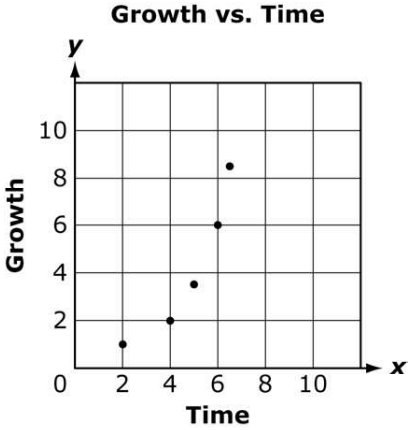
A $y = x$

B $y = -x$

C $y = 2x$

D $y = -2x$

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



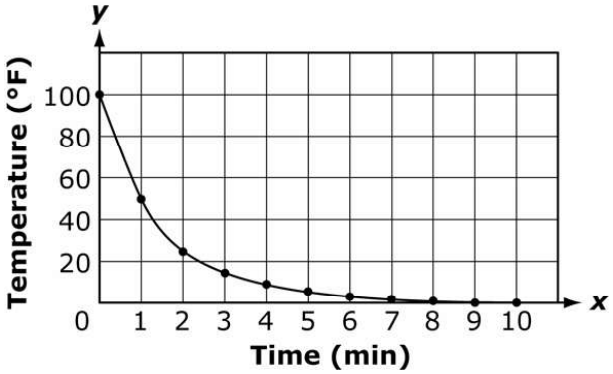
A exponential

B logarithmic

C quadratic

D linear

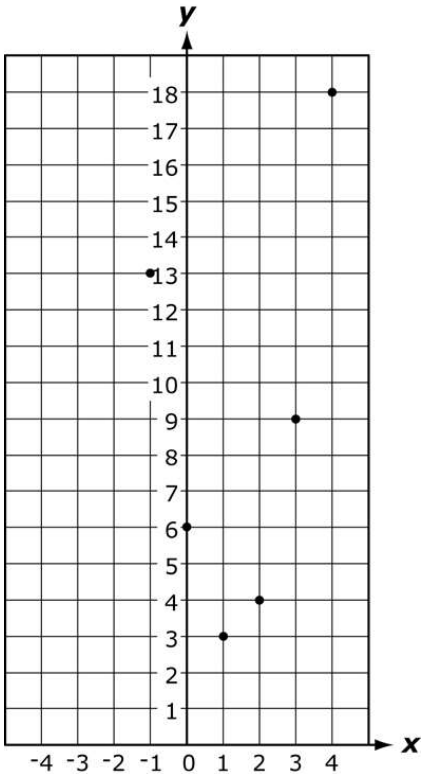
119. Students in a science classroom perform an experiment to find the rate at which a hot liquid cools in a freezer. They plot the temperature over time and obtain the following graph.



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

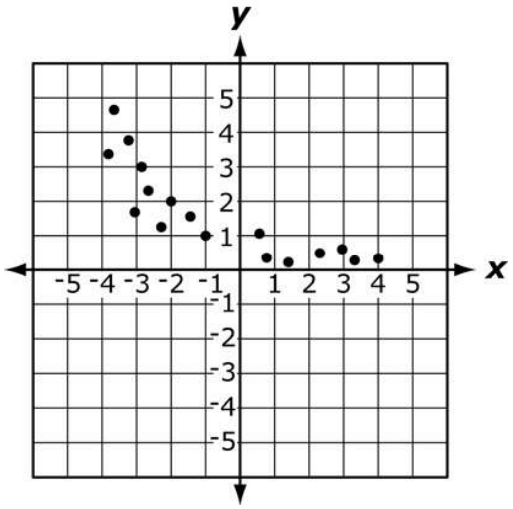
A exponential
B logarithmic
C quadratic
D linear

120. 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 $y = 2x^2 - 5x + 6$

121. Which equation best models the data in this scatter plot?



A $y = 5 \cdot 3^x$

B $y = 0.5 \cdot 3^x$

C $y = 5 \cdot 0.5^x$

D $y = 0.5 \cdot 5^x$

Objective 3.3

122. What is the 12th term in the sequence {1, 3, 5, 7,…}?

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

A 22

B 23

C 24

D 25

123. What is the sum of the first 6 terms of the series 2+10+50+…?

Arithmetic Sequences & Series

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

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

Geometric Sequences & Series

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

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

A 3,906
B 7,812
C 15,624
D 31,248

124. 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?

Arithmetic Sequences & Series

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

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

Geometric Sequences & Series

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

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

A $ 6.25
B $7.00
C $93.00
D $100.00

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

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

A -4
B -2
C 2
D $\frac{9}{2}$

126. Which formula could be used to find the sum of an arithmetic series if the last term is unknown?

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

A $s_n = \frac{n}{2}(2a_1 + (n-1)d)$

B $s_n = \frac{n}{2}(2a_1 + (n+1)d)$

C $s_n = n(2a_1 + (n-1)d)$

D $s_n = n(2a_1 + (n+1)d)$

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

Arithmetic Sequences & Series

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

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

Geometric Sequences & Series

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

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

A 41 integers
B 42 integers
C 44 integers
D 45 integers

128. 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?

Arithmetic Sequences & Series

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

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

Geometric Sequences & Series

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

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

A 4 terms
B 5 terms
C 6 terms
D 23 terms