

Student: _____
Date: _____

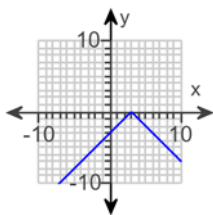
Instructor: Alfredo Alvarez
Course: 2017 Spring Math 1314

Assignment: Practice Final

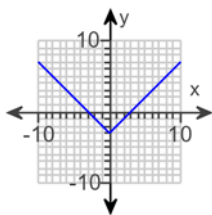
1. Graph the equation.

$$y = -|x| - 3$$

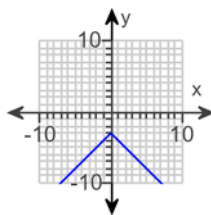
A.



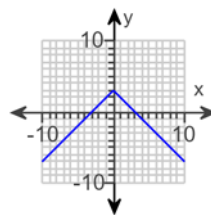
B.



C.



D.



ID: 1.1-11

2. Perform the multiplication and write the expression shown below in standard form.

$$(5 - 6i)(-5 + 4i)$$

A. $-1 + 50i$

B. $-49 - 10i$

C. $-1 - 10i$

D. $-49 + 50i$

ID: 1.4-8

3. Divide and express the result in standard form.

$$\frac{7}{8 - i}$$

A. $\frac{56}{65} - \frac{7}{65}i$

B. $\frac{56}{65} + \frac{7}{65}i$

C. $\frac{8}{9} - \frac{1}{9}i$

D. $\frac{8}{9} + \frac{1}{9}i$

ID: 1.4-14

4. Solve the equation by factoring.

$$x^2 + 7x - 60 = 0$$

- A. $\{-12, 5\}$
 B. $\{12, -5\}$
 C. $\{12, 5\}$
 D. $\{-12, 1\}$

ID: 1.5-1

5. Solve for the variable x in the equation shown below.

$$16x^2 + 32x + 15 = 0$$

- A. $\left\{\frac{3}{4}, \frac{5}{4}\right\}$
 B. $\left\{-\frac{3}{4}, -\frac{5}{4}\right\}$
 C. $\left\{\frac{3}{4}, -\frac{5}{4}\right\}$
 D. $\left\{-\frac{3}{16}, -\frac{1}{3}\right\}$

ID: 1.5-2

6. Solve the equation by the square root property.

$$(4x + 2)^2 = 36$$

- A. $\{-2, 1\}$
 B. $\{1, 2\}$
 C. $\{-10, 10\}$
 D. $\{0, 1\}$

ID: 1.5-10

7. Solve the equation by completing the square.

$$x^2 + 12x + 72 = 0$$

- A. $\{0, -12\}$
 B. $\{-6 \pm 36i\}$
 C. $\{-6 \pm 6i\}$
 D. $\{-6 + 6i\}$

ID: 1.5-19

8. Solve the equation using the quadratic formula.

$$x^2 + 4x - 96 = 0$$

- A. $\{-12, 1\}$
 B. $\{-8, 12\}$
 C. $\{12, 8\}$
 D. $\{-12, 8\}$

ID: 1.5-22

9. Solve the equation using the quadratic formula.

$$7x^2 + 8x + 2 = 0$$

- A. $\left\{\frac{-4 - \sqrt{2}}{7}, \frac{-4 + \sqrt{2}}{7}\right\}$
 B. $\left\{\frac{-4 - \sqrt{30}}{7}, \frac{-4 + \sqrt{30}}{7}\right\}$
 C. $\left\{\frac{-4 - \sqrt{2}}{14}, \frac{-4 + \sqrt{2}}{14}\right\}$
 D. $\left\{\frac{-8 - \sqrt{2}}{7}, \frac{-8 + \sqrt{2}}{7}\right\}$

ID: 1.5-24

10. Solve the equation using the quadratic formula.

$$x^2 + 12x + 52 = 0$$

- A. $\{-6 - 4i, -6 + 4i\}$
 B. $\{-6 + 4i\}$
 C. $\{-10, -2\}$
 D. $\{-6 - 16i, -6 + 16i\}$

ID: 1.5-26

11. Solve the equation by the method of your choice.

$$9x^2 - 71x - 8 = 0$$

- A. $\left\{-\frac{1}{9}, 8\right\}$
- B. $\{-9, 8\}$
- C. $\left\{-\frac{1}{9}, 9\right\}$
- D. $\left\{-\frac{1}{9}, \frac{1}{71}\right\}$

ID: 1.5-31

12. Solve the equation by the method of your choice.

$$6x^2 = -12x - 5$$

- A. $\left\{\frac{-12 - \sqrt{6}}{6}, \frac{-12 + \sqrt{6}}{6}\right\}$
- B. $\left\{\frac{-6 - \sqrt{66}}{6}, \frac{-6 + \sqrt{66}}{6}\right\}$
- C. $\left\{\frac{-6 - \sqrt{6}}{6}, \frac{-6 + \sqrt{6}}{6}\right\}$
- D. $\left\{\frac{-6 - \sqrt{6}}{12}, \frac{-6 + \sqrt{6}}{12}\right\}$

ID: 1.5-33

13. Solve the equation by the method of your choice.

$$x^2 + 14x + 38 = 0$$

- A. $\{7 - \sqrt{38}, 7 + \sqrt{38}\}$
- B. $\{7 + \sqrt{11}\}$
- C. $\{-7 - \sqrt{11}, -7 + \sqrt{11}\}$
- D. $\{-14 + \sqrt{38}\}$

ID: 1.5-36

14. Solve the polynomial equation by factoring and then using the zero product principle.

$$x^3 + 4x^2 - x - 4 = 0$$

- A. $\{-1, 1, -4\}$
 B. $\{-4, 4\}$
 C. $\{1, -4, 4\}$
 D. $\{16\}$

ID: 1.6-4

15. Solve the radical equation, and check all proposed solutions.

$$\sqrt{x+1} = 2$$

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

ID: 1.6-6

16. Solve the radical equation, and check all proposed solutions.

$$\sqrt{25x-4} = x+6$$

- A. $\{8\}$
 B. $\{5\}$
 C. $\{8, 5\}$
 D. \emptyset

ID: 1.6-8

17. Solve the radical equation, and check all proposed solutions.

$$x - \sqrt{3x-2} = 4$$

- A. $\{1, 2\}$
 B. $\{-1\}$
 C. $\{9\}$
 D. $\{2, 9\}$

ID: 1.6-9

18. Solve the absolute value equation or indicate that the equation has no solution.

$$|4x + 8| + 6 = 15$$

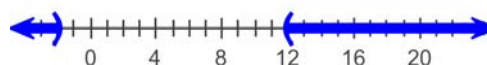
- A. $\left\{-\frac{1}{4}, \frac{17}{4}\right\}$
- B. $\left\{-\frac{17}{8}, \frac{1}{8}\right\}$
- C. $\left\{-\frac{17}{4}, \frac{1}{4}\right\}$
- D. \emptyset

ID: 1.6-47

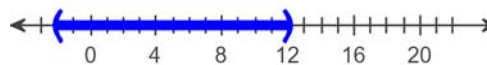
19. Solve the absolute value inequality using an equivalent compound inequality. Other than \emptyset , use interval notation to express the solution set and graph the solution set on a number line.

$$|x - 5| < 7$$

- A. $[-2, 12]$
- B. $(-\infty, -2) \cup (12, \infty)$



- C. \emptyset
- D. $(-2, 12)$

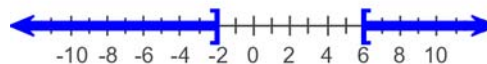


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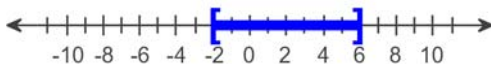
20. Solve the absolute value inequality using an equivalent compound inequality. Other than \emptyset , use interval notation to express the solution set and graph the solution set on a number line.

$$3 + \left|1 - \frac{x}{2}\right| \geq 5$$

- A. $(-\infty, -6] \cup [2, \infty)$
- B. $(-\infty, -2] \cup [6, \infty)$



- C. $[-2, 6]$
- D. $[-6, 2]$

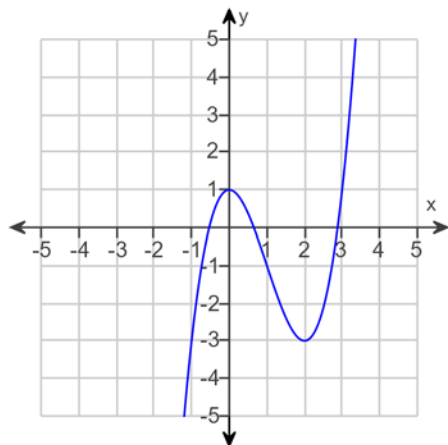


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21.

Use the graph of the given function to find any relative maxima and relative minima.

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



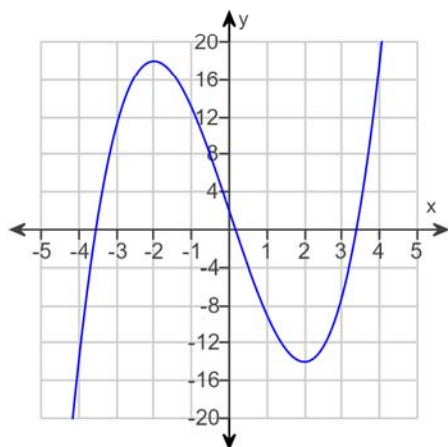
- A. Maximum: none; minimum: (2, -3)
- B. Maximum: (0, 1); minimum: none
- C. Maximum: (0, 1); minimum: (2, -3)
- D. No maximum or minimum

ID: 2.2-6

22.

Use the graph of the given function to find any relative maxima and relative minima.

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



- A. Minimum: (2, -14)
Maximum: (-2, 18)
- B. No maxima or minima
- C. Maximum: (2, -14)
Minimum: (-2, 18)
- D. Maxima: (-2, 18) and (0, 0)
Minimum: (2, -14)

ID: 2.2-7

23. Evaluate the piecewise function at the given value of the independent variable.

$$f(x) = \begin{cases} -3x - 4 & \text{if } x < -1 \\ -2x + 4 & \text{if } x \geq -1 \end{cases}; f(-1)$$

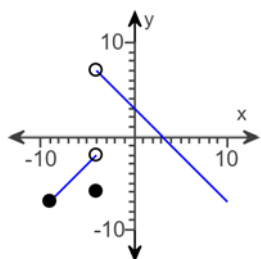
- A. 5
 B. 6
 C. -1
 D. 6 and -1

ID: 2.2-8

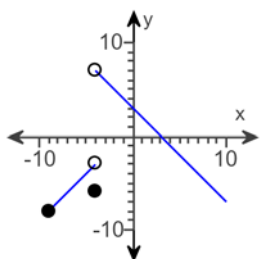
24. Graph the function.

$$f(x) = \begin{cases} x + 1 & \text{if } -9 \leq x < -4 \\ -6 & \text{if } x = -4 \\ -x + 3 & \text{if } x > -4 \end{cases}$$

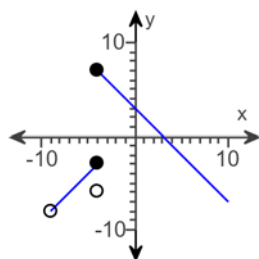
A.



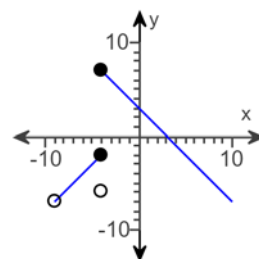
B.



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D.



ID: 2.2-11

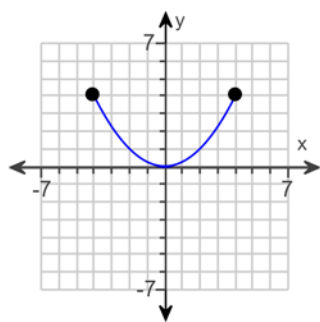
25. Find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$ for the given function.

$$f(x) = x^2 + 2x - 8$$

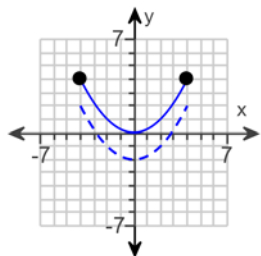
- A. $2x + h + 2$
 B. $2x + h - 8$
 C. $\frac{2x^2 + 2x + 2xh + h^2 + h - 16}{h}$
 D. 1

ID: 2.2-19

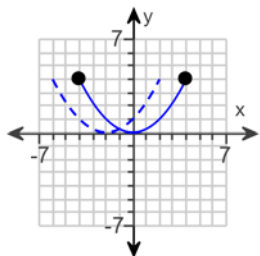
26. Use the graph of the function f , plotted with a solid line, to sketch the graph of $g(x) = f(x - 2)$.



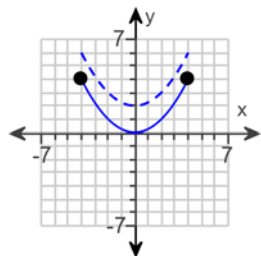
A.



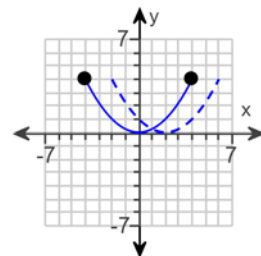
B.



C.



D.

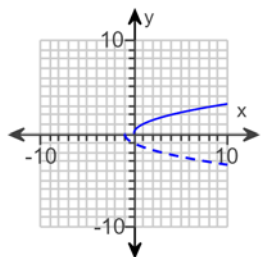


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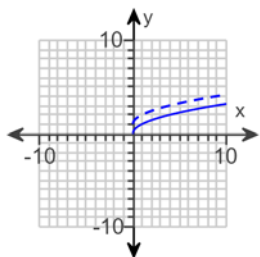
27. Begin by graphing the standard square root function $f(x) = \sqrt{x}$. Then use transformations of this graph to graph the given function.

$$h(x) = \sqrt{x+1}$$

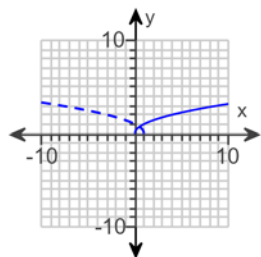
A.



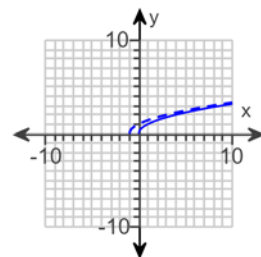
B.



C.



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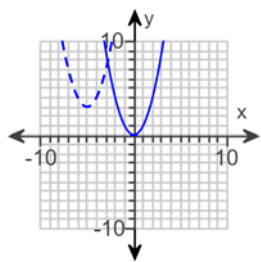


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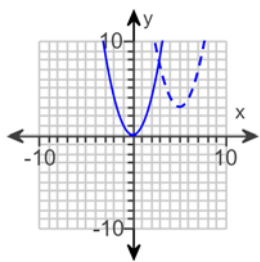
28. Begin by graphing the standard quadratic function $f(x) = x^2$. Then use transformations of this graph to graph the given function.

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

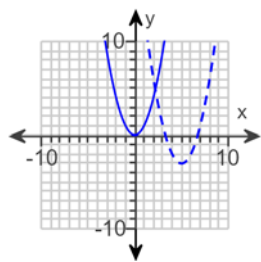
A.



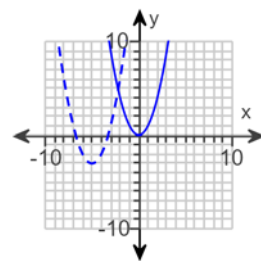
B.



C.



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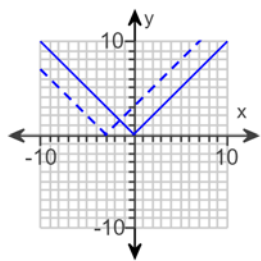


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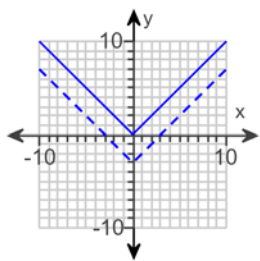
29. Begin by graphing the standard absolute value function $f(x) = |x|$. Then use transformations of this graph to graph the given function.

$$g(x) = |x| - 3$$

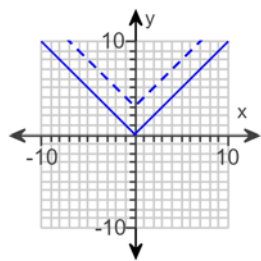
A.



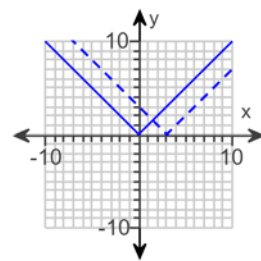
B.



C.



D.



ID: 2.5-17

30. Find the domain of the function.

$$f(x) = \sqrt{12 - x}$$

A. $(-\infty, 24) \cup (24, \infty)$

B. $(-\infty, 12) \cup (12, \infty)$

C. $(-\infty, 24]$

D. $(-\infty, 12]$

ID: 2.6-5

31. Given functions f and g , find $f - g$.

$$f(x) = 9x - 7, g(x) = 4x - 9$$

- A. $5x + 2$
 B. $13x - 16$
 C. $5x - 16$
 D. $-5x - 2$

ID: 2.6-9

32. Given functions f and g , find $\frac{f}{g}$.

$$f(x) = 5x^2 - 8x, g(x) = x^2 - 4x - 32$$

- A. $\frac{5x}{x+1}$
 B. $\frac{5-x}{32}$
 C. $-\frac{5x-8}{4}$
 D. $\frac{5x^2-8x}{x^2-4x-32}$

ID: 2.6-10

33. Given functions f and g , find $f + g$.

$$f(x) = 7 - 5x, g(x) = -2x + 5$$

- A. $-2x + 7$
 B. $-3x + 12$
 C. $-7x + 12$
 D. $5x$

ID: 2.6-11

34. Given functions f and g , find fg .

$$f(x) = 5x - 6, g(x) = 8x + 9$$

- A. $13x^2 - 3x + 3$
 B. $40x^2 - 39x - 54$
 C. $40x^2 - 3x - 54$
 D. $40x^2 - 54$

ID: 2.6-12

35. For the given functions f and g , find the indicated composition.

$$f(x) = -4x + 5, g(x) = 5x + 4; (g \circ f)(x)$$

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

ID: 2.6-23

36. For the given functions f and g , find the indicated composition.

$$f(x) = \frac{5}{x-4}, g(x) = \frac{2}{7x}; (f \circ g)(x)$$

- A. $\frac{2x-8}{35x}$
 B. $\frac{5x}{2-28x}$
 C. $\frac{35x}{2-28x}$
 D. $\frac{35x}{2+28x}$

ID: 2.6-24

37. For the given functions f and g , find the indicated composition.

$$f(x) = \frac{x-10}{8}, g(x) = 8x + 10; (g \circ f)(x)$$

- A. $x - \frac{5}{4}$
 B. x
 C. $8x + 70$
 D. $x + 20$

ID: 2.6-25

38. Find the distance between the pair of points.

$(-2, 2)$ and $(-14, 7)$

- A. 13
 B. 26
 C. 169
 D. 14

ID: 2.8-1

39. Find the midpoint of the line segment whose end points are given.

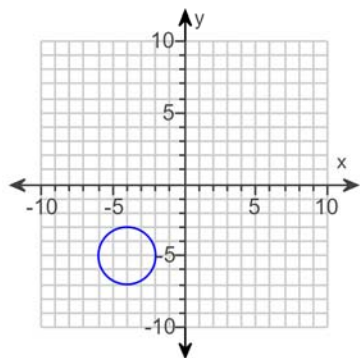
$(-4, -8)$ and $(-9, 3)$

- A. $\left(\frac{5}{2}, -\frac{11}{2}\right)$
 B. $(-13, -5)$
 C. $\left(-\frac{13}{2}, -\frac{5}{2}\right)$
 D. $(5, -11)$

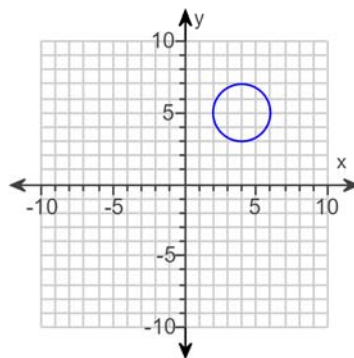
ID: 2.8-7

40. Graph the equation, and find the domain and range.

$$(x - 4)^2 + (y - 5)^2 = 4$$



Domain: $[-6, -2]$, Range: $[-7, -3]$



Domain: $[2, 6]$, Range: $[3, 7]$

ID: 2.8-14

41. Complete the square and write the equation in standard form. Then give the center and radius of the circle.

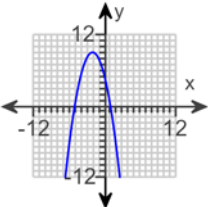
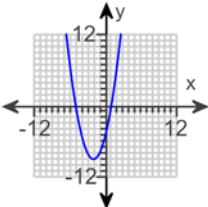
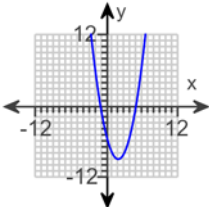
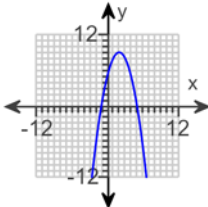
$$x^2 + 14x + 49 + y^2 - 8y + 16 = 16$$

- A. $(x - 4)^2 + (y + 7)^2 = 16$
Center: $(-4, 7)$, radius: 16
- B. $(x + 7)^2 + (y - 4)^2 = 16$
Center: $(-7, 4)$, radius: 4
- C. $(x + 7)^2 + (y - 4)^2 = 16$
Center: $(7, -4)$, radius: 16
- D. $(x - 4)^2 + (y + 7)^2 = 16$
Center: $(4, -7)$, radius: 4

ID: 2.8-15

42. Use the vertex and intercepts to sketch the graph of the quadratic function.

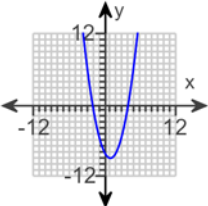
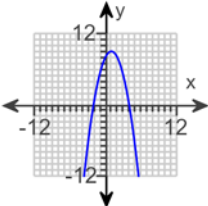
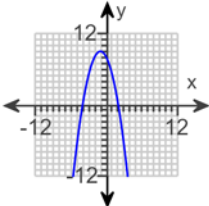
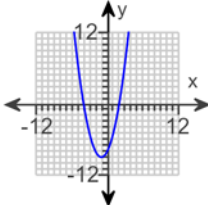
$$f(x) = -x^2 - 4x + 5$$

- A. 
- B. 
- C. 
- D. 

ID: 3.1-4

43. Use the vertex and intercepts to sketch the graph of the quadratic function.

$$f(x) = x^2 - 2x - 8$$

- A. 
- B. 
- C. 
- D. 

ID: 3.1-5

44. The profit that the vendor makes per day by selling x pretzels is given by the function $P(x) = -4x^2 + 2,400x - 350$. Find the number of pretzels that must be sold to maximize profit.

- A. 600 pretzels
 B. 300 pretzels
 C. 1,200 pretzels
 D. 359,650 pretzels

ID: 3.1-19

45. An arrow is fired into the air with an initial velocity of 128 feet per second. The height in feet of the arrow t seconds after it was shot into the air is given by the function $h(x) = -16t^2 + 128t$. Find the maximum height of the arrow.

- A. 64 ft
 B. 448 ft
 C. 256 ft
 D. 768 ft

ID: 3.1-24

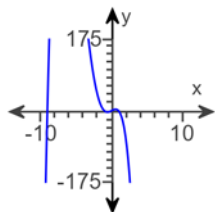
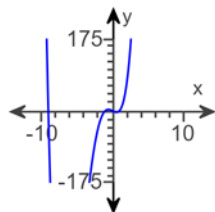
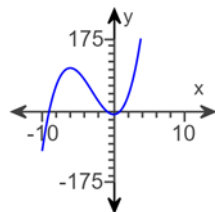
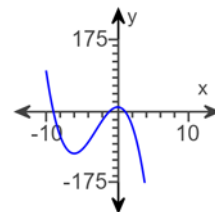
46. April shoots an arrow upward into the air at a speed of 32 feet per second from a platform that is 34 feet high. The height of the arrow is given by the function $h(t) = -16t^2 + 32t + 34$, where t is the time in seconds. What is the maximum height of the arrow?

- A. 50 ft
 B. 34 ft
 C. 33 ft
 D. 16 ft

ID: 3.1-26

47. Graph the polynomial function.

$$f(x) = x^3 + 9x^2 - x - 9$$

 A. B. C. D.

ID: 3.2-46

48. Find the zeros of the polynomial function.

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

- A. $x = 0, x = 1, x = 2$
 B. $x = -3, x = 2$
 C. $x = 1, x = 2$
 D. $x = 0, x = -3, x = 2$

ID: 3.2-67

49. Find the zeros of the polynomial function.

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

- A. $x = 1, x = -4, x = 4$
 B. $x = 16$
 C. $x = -1, x = 1, x = -4$
 D. $x = -4, x = 4$

ID: 3.2-68

50. Use synthetic division to show that the number given to the right of the equation is a solution of the equation, then solve the polynomial equation.

$$x^3 - 5x^2 - 2x + 24 = 0; 4$$

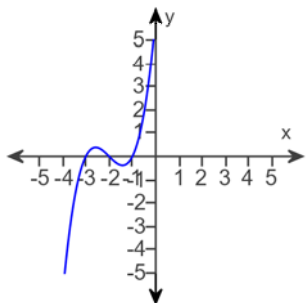
- A. $\{3, 2, 4\}$
 B. $\{3, -2, 4\}$
 C. $\{-3, 2, 4\}$
 D. $\{-3, -2, 4\}$

ID: 3.3-24

51.

Use the graph or a table to determine a solution of the equation. Use synthetic division to verify that this number is a solution of the equation. Then solve the polynomial equation.

$$x^3 + 6x^2 + 11x + 6 = 0$$



ID: 3.3-27

- A. -1; The remainder is zero; -1, 2, and -3, or $\{-3, -1, 2\}$
- B. -1; The remainder is zero; -1, -2, and -3, or $\{-3, -2, -1\}$
- C. -1; The remainder is zero; -1, -2, and 3, or $\{-2, -1, 3\}$
- D. -1; The remainder is zero; 1, -2, and -3, or $\{-3, -2, 1\}$

52. Find a rational zero of the polynomial function and use it to find all the zeros of the function.

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

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

ID: 3.4-9

53. Find a rational zero of the polynomial function and use it to find all the zeros of the function.

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

- A. $\{1, -1, 6\}$
- B. $\{-2, -2 + \sqrt{7}, -2 - \sqrt{7}\}$
- C. $\{2, -4 + \sqrt{7}, -4 - \sqrt{7}\}$
- D. $\{-2, -4 + \sqrt{6}, -4 - \sqrt{6}\}$

ID: 3.4-11

54. Find a rational zero of the polynomial function and use it to find all the zeros of the function.

$$f(x) = x^3 - 2x^2 + 5x + 26$$

- A. $\{-2, 2 + 3i, 2 - 3i\}$
 B. $\{-2, 3 + 2i, 3 - 2i\}$
 C. $\{2, 2 + \sqrt{5}, 4 - \sqrt{5}\}$
 D. $\{-2, 3 + \sqrt{5}, 3 - \sqrt{5}\}$

ID: 3.4-12

55. Solve the polynomial equation. In order to obtain the first root, use synthetic division to test the possible rational roots.

$$x^3 + 3x^2 - 4x - 12 = 0$$

- A. $\{-2\}$
 B. $\{-3\}$
 C. $\{-2, 2, 3\}$
 D. $\{-3, -2, 2\}$

ID: 3.4-16

56. Find the vertical asymptotes, if any, of the graph of the rational function.

$$g(x) = \frac{x}{x^2 - 9}$$

- A. $x = 3, x = -3, x = 0$
 B. $x = 3, x = -3$
 C. $x = 3$
 D. no vertical asymptote

ID: 3.5-12

57. Find the horizontal asymptote, if any, of the graph of the rational function.

$$g(x) = \frac{8x^2 - 3x - 5}{3x^2 - 6x + 9}$$

- A. $y = 0$
 B. $y = \frac{8}{3}$
 C. $y = \frac{1}{2}$
 D. no horizontal asymptote

ID: 3.5-18

58. Find the slant asymptote, if any, of the graph of the rational function.

$$f(x) = \frac{x^2 - 7x + 5}{x + 6}$$

- A. $x = y + 7$
 B. $y = x + 12$
 C. $y = x - 13$
 D. no slant asymptote

ID: 3.5-47

59. A city is growing at the rate of 0.7% annually. If there were 3,287,000 residents in the city in 1992, find how many (to the nearest ten-thousand) are living in that city in 2000. Use $y = 3,287,000(2.7)^{0.007t}$.

- A. 3,510,000
 B. 500,000
 C. 8,870,000
 D. 3,480,000

ID: 4.1-6

60. The size of the coyote population at a national park increases at the rate of 5% per year. If the size of the current population is 185, find how many coyotes there should be in 5 years. Use the function $f(x) = 185e^{0.05t}$ and round to the nearest whole number.

- A. 236
 B. 238
 C. 242
 D. 240

ID: 4.1-8

61. Find the domain of the logarithmic function.

$$f(x) = \log_3(x + 1)$$

- A. $(1, \infty)$
 B. $(-\infty, 0)$ or $(0, \infty)$
 C. $(-1, \infty)$
 D. $(3, \infty)$

ID: 4.2-31

62. Use properties of logarithms to expand the logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

$$\log_b \left(\frac{xy^2}{z^3} \right)$$

- A. $\log_b x + \log_b y^2 - \log_b z^3$
- B. $\log_b x + 2 \log_b y + 3 \log_b z$
- C. $\log_b x + \log_b y^2 + \log_b z^3$
- D. $\log_b x + 2 \log_b y - 3 \log_b z$

ID: 4.3-19

63. Use properties of logarithms to expand the logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

$$\log_9 \left(\frac{\sqrt[5]{m} \sqrt[4]{n}}{k^2} \right)$$

- A. $5 \log_9 m + 4 \log_9 n - 2 \log_9 k$
- B. $\frac{1}{5} \log_9 m \cdot \frac{1}{4} \log_9 n \div 2 \log_9 k$
- C. $\frac{1}{5} \log_9 m + \frac{1}{4} \log_9 n - 2 \log_9 k$
- D. $\frac{5}{9} \log_9 m + \frac{4}{9} \log_9 n - \frac{2}{9} \log_9 k$

ID: 4.3-21

64. Use properties of logarithms to expand the logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

$$\log_a \left(\frac{x^4 \sqrt[3]{x+5}}{(x-2)^2} \right)$$

- A. $4 \log_a x - 3 \log_a(x+5) - 2 \log_a(x-2)$
- B. $4 \log_a x + \frac{1}{3} \log_a(x+5) - 2 \log_a(x-2)$
- C. $\log_a x^4 + \log_a(x+5)^{1/3} - \log_a(x-2)^2$
- D. $\log_a x^4 + \log_a(x+5)^{-3} - \log_a(x-2)^2$

ID: 4.3-22

65. Solve the equation by expressing each side as a power of the same base and then equating exponents.

$$3^{(1+2x)} = 243$$

- A. {6}
- B. {2}
- C. {81}
- D. {-2}

ID: 4.4-1

66. Solve the equation by expressing each side as a power of the same base and then equating exponents.

$$4^{(5-3x)} = \frac{1}{256}$$

- A. {128}
- B. $\left\{\frac{1}{64}\right\}$
- C. {-3}
- D. {3}

ID: 4.4-2

67. Solve the equation by expressing each side as a power of the same base and then equating exponents.

$$4^{(3x+7)} = \frac{1}{16}$$

- A. {-3}
- B. {3}
- C. {4}
- D. $\left\{\frac{1}{4}\right\}$

ID: 4.4-3

68. Solve the exponential equation. Express the solution set in terms of natural logarithms.

$$7^{9x} = 4.5$$

- A. $\left\{ \frac{4.5 \ln 9}{\ln 7} \right\}$
- B. $\left\{ \frac{\ln 4.5}{7 \ln 9} \right\}$
- C. $\left\{ \frac{\ln 4.5}{9 \ln 7} \right\}$
- D. $\left\{ \frac{9 \ln 4.5}{\ln 7} \right\}$

ID: 4.4-8

69. Solve the exponential equation. Express the solution set in terms of natural logarithms.

$$2^{x+7} = 3$$

- A. $\ln 3 - \ln 2 - \ln 7$
- B. $\left\{ \frac{\ln 3}{\ln 2} - 7 \right\}$
- C. $\left\{ \frac{\ln 2}{\ln 3} + 7 \right\}$
- D. $\left\{ \frac{\ln 2}{\ln 3} + \ln 7 \right\}$

ID: 4.4-9

70. Solve the exponential equation. Express the solution set in terms of natural logarithms.

$$e^{x+7} = 5$$

- A. $\{e^5 + 7\}$
- B. $\ln 12$
- C. $\{e^{35}\}$
- D. $\ln 5 - 7$

ID: 4.4-10

71. Solve the exponential equation. Use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.

$$10^x = 2.56$$

- A. 0.94
 B. 25.60
 C. 0.41
 D. 363.08

ID: 4.4-12

72. Solve the exponential equation. Use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.

$$5e^x = 26$$

- A. 1.65
 B. -1.65
 C. 0.72
 D. -0.72

ID: 4.4-14

73. Solve the exponential equation. Use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.

$$6^{4x} = 3.4$$

- A. 0.15
 B. 0.17
 C. -0.17
 D. 2.73

ID: 4.4-15

74. Solve the exponential equation. Use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.

$$e^{3x} = 7$$

- A. 0.65
 B. 0.16
 C. 6.34
 D. 5.84

ID: 4.4-16

75. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log_4(x - 5) + \log_4(x - 11) = 2$$

- A. {13, 3}
- B. {14}
- C. {13}
- D. {3}

ID: 4.4-22

76. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log_5(x + 2) - \log_5 x = 2$$

- A. {5}
- B. $\left\{\frac{1}{12}\right\}$
- C. {12}
- D. $\left\{\frac{2}{25}\right\}$

ID: 4.4-28

77. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\ln 6 + \ln(x - 1) = 0$$

- A. $\left\{\frac{1}{6}\right\}$
- B. $\left\{\frac{6}{7}\right\}$
- C. {1}
- D. $\left\{\frac{7}{6}\right\}$

ID: 4.4-29

78. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log_5(x+2) - \log_5(x-3) = 1$$

- A. $\left\{-\frac{17}{4}\right\}$
- B. $\left\{\frac{17}{4}\right\}$
- C. $\left\{\frac{5}{4}\right\}$
- D. \emptyset

ID: 4.4-30

79. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log(2+x) - \log(x-3) = \log 2$$

- A. $\{8\}$
- B. $\{-8\}$
- C. $\left\{\frac{3}{2}\right\}$
- D. \emptyset

ID: 4.4-34

80. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log(2+x) - \log(x-3) = \log 2$$

- A. $\{8\}$
- B. $\left\{\frac{3}{2}\right\}$
- C. \emptyset
- D. $\{-8\}$

ID: 4.4-38

81. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\ln x + \ln(x - 1) = \ln 56$$

- A. $\left\{\frac{57}{2}\right\}$
 B. $\{-7\}$
 C. $\{8\}$
 D. $\{8, -7\}$

ID: 4.4-39

82. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\ln x + \ln(x - 1) = \ln 30$$

- A. $\left\{\frac{31}{2}\right\}$
 B. $\{-5\}$
 C. $\{6, -5\}$
 D. $\{6\}$

ID: 4.4-39

83. Find out how long it takes a \$3,500 investment to double if it is invested at 9% compounded quarterly. Round to the nearest tenth of a year. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$.
-

- A. 8.0 years
 B. 7.8 years
 C. 8.2 years
 D. 7.6 years

ID: 4.4-43

84. The size of the coyote population at a national park increases at the rate of 5% per year. If the size of the current population is 159, find how many coyotes there should be in 7 years. Use $y = y_0 e^{0.05t}$ and round to the nearest whole number.
-

- A. 228
 B. 224
 C. 230
 D. 226

ID: 4.4-50

85. The function $A = A_0 e^{-0.00866x}$ models the amount in pounds of a particular radioactive material stored in a concrete vault, where x is the number of years since the material was put into the vault. If 200 pounds of the material are initially put into the vault, how many pounds will be left after 30 years? Round to nearest whole number.
-
- A. 267 pounds
- B. 38 pounds
- C. 154 pounds
- D. 31 pounds

ID: 4.4-51

86. The function $A = A_0 e^{-0.01155x}$ models the amount in pounds of a particular radioactive material stored in a concrete vault, where x is the number of years since the material was put into the vault. If 200 pounds of the material are placed in the vault, how much time will need to pass for only 112 pounds to remain? Round to nearest whole number.
-
- A. 55 years
- B. 50 years
- C. 100 years
- D. 60 years

ID: 4.5-4

87. The half-life of silicon-32 is 710 years. If 90 grams is present now, how much will be present in 800 years? (Round your answer to three decimal places.)
-
- A. 0.037
- B. 83.238
- C. 41.215
- D. 2.697

ID: 4.5-6

88. The population of a certain country is growing at a rate of 1.9% per year. How long will it take for this country's population to double? Use the formula $t = \frac{\ln 2}{k}$, which gives the time, t , for a population with growth rate k , to double. (Round to the nearest whole year.)
-
- A. 38 years
- B. 36 years
- C. 37 years
- D. 35 years

ID: 4.5-8

89. Solve the system of equations.

$$4x + 4y + z = -11$$

$$4x - 3y - z = 30$$

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

-
- A. $\{(3, -3, -5)\}$
 B. $\{(3, -5, -3)\}$
 C. $\{(-5, 3, -3)\}$
 D. $\{(-3, -5, 3)\}$

ID: 5.2-11

90. Solve the system by the substitution method.

$$x - y = 3$$

$$x^2 = y^2 + 39$$

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

ID: 5.4-5

91. Solve the system of equations using matrices. Use Gaussian elimination with back-substitution.

$$x + y + z = -5$$

$$x - y + 2z = -6$$

$$3x + y + z = -1$$

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

ID: 6.1-2

92. Find the product AB , if possible.

$$A = \begin{bmatrix} -1 & 3 \\ 5 & 6 \end{bmatrix}, B = \begin{bmatrix} 0 & -2 & 4 \\ 1 & -3 & 2 \end{bmatrix}$$

A. $\begin{bmatrix} 3 & 6 \\ -7 & -28 \\ 2 & 32 \end{bmatrix}$

B. $\begin{bmatrix} 0 & -6 & 12 \\ 5 & -18 & 12 \end{bmatrix}$

C. AB is not defined.

D. $\begin{bmatrix} 3 & -7 & 2 \\ 6 & -28 & 32 \end{bmatrix}$

ID: 6.3-17

93. Evaluate the determinant.

$$\begin{vmatrix} -3 & -5 & -3 \\ 4 & 0 & -3 \\ 5 & 0 & -5 \end{vmatrix}$$

A. -175

B. 175

C. 25

D. -25

ID: 6.5-13

94. Use Cramer's rule to solve the system.

$$2x + 5y - z = 48$$

$$x - 5y + 4z = -21$$

$$5x + y + z = 34$$

A. $\{(4, 9, 5)\}$

B. $\{(9, 5, 9)\}$

C. $\{(4, -9, -5)\}$

D. $\{(5, 7, 5)\}$

ID: 6.5-21

95. Find the indicated sum.

$$\sum_{i=3}^6 6i$$

- A. 36
 B. 108
 C. 72
 D. 54

ID: 8.1-25

96. Find the indicated sum.

$$\sum_{i=3}^6 (3i - 4)$$

- A. 33
 B. 38
 C. 23
 D. 42

ID: 8.1-27

97. Find the indicated sum.

$$\sum_{i=1}^4 2^i$$

- A. 14
 B. 18
 C. 30
 D. 20

ID: 8.1-29

98. Use the formula for the sum of the first n terms of an arithmetic sequence to find the indicated sum.

$$\sum_{i=1}^{47} (4i - 5)$$

- A. 4,277
 B. 4,183
 C. 4,441.5
 D. 4,606

ID: 8.2-28

99. Find the indicated sum. Use the formula for the sum of the first n terms of a geometric sequence.

$$\sum_{i=1}^5 4 \cdot 4^i$$

- A. 1,360
 B. 5,456
 C. 272
 D. 10,280

ID: 8.3-33

100. Use the Binomial Theorem to expand the binomial and express the result in simplified form.

$$(3x + 2)^3$$

- A. $27x^3 + 54x^2 + 54x + 8$
 B. $27x^3 + 54x^2 + 36x + 8$
 C. $9x^2 + 12x + 4$
 D. $9x^6 + 6x^3 + 64$

ID: 8.5-7

101. Use the Binomial Theorem to expand the binomial and express the result in simplified form.

$$(2x + 3)^4$$

- A. $48x^4 + 288x^3 + 216x^2 + 648x + 81$
 B. $16x^4 + 81x^4$
 C. $16x^3 + 96x^2 + 216x + 216$
 D. $16x^4 + 96x^3 + 216x^2 + 216x + 81$

ID: 8.5-9

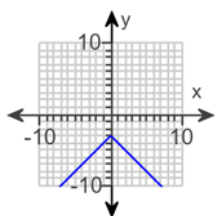
102. Write the first three terms in the binomial expansion, expressing the result in simplified form.

$$(x + 2)^{17}$$

- A. $x^{17} + 32x^{16} + 1,088x^{15}$
 B. $x^{17} + 34x^{16} + 1,088x^{15}$
 C. $x^{17} + 34x^{16} + 544x^{15}$
 D. $x^{17} + 32x^{16} + 544x^{15}$

ID: 8.5-12

1.



C.

2. A. $-1 + 50i$

3. B. $\frac{56}{65} + \frac{7}{65}i$

4. A. $\{-12, 5\}$

5. B. $\left\{-\frac{3}{4}, -\frac{5}{4}\right\}$

6. A. $\{-2, 1\}$

7. C. $\{-6 \pm 6i\}$

8. D. $\{-12, 8\}$

9. A. $\left\{\frac{-4 - \sqrt{2}}{7}, \frac{-4 + \sqrt{2}}{7}\right\}$

10. A. $\{-6 - 4i, -6 + 4i\}$

11. A. $\left\{-\frac{1}{9}, 8\right\}$

12. C. $\left\{\frac{-6 - \sqrt{6}}{6}, \frac{-6 + \sqrt{6}}{6}\right\}$

13. C. $\{-7 - \sqrt{11}, -7 + \sqrt{11}\}$

14. A. $\{-1, 1, -4\}$

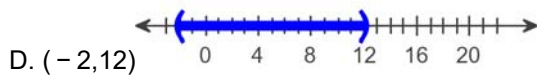
15. C. {3}

16. C. {8, 5}

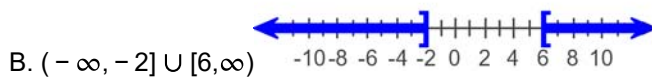
17. C. {9}

18. C. $\left\{-\frac{17}{4}, \frac{1}{4}\right\}$

19.



20.

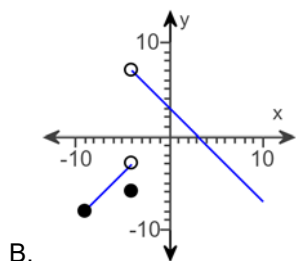


21. C. Maximum: (0,1); minimum: (2, -3)

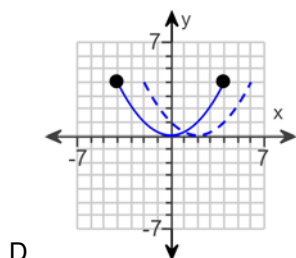
22. A. Minimum: (2, -14) Maximum: (-2, 18)

23. B. 6

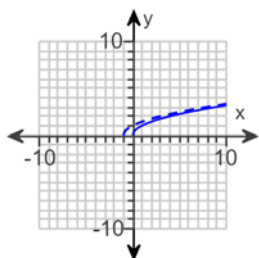
24.

25. A. $2x + h + 2$

26.

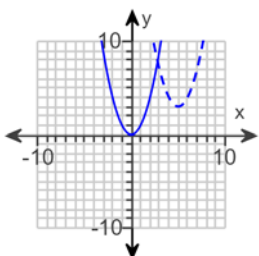


27.



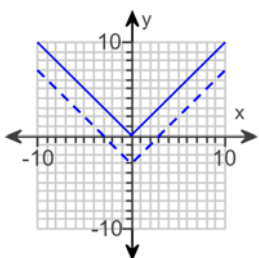
D.

28.



B.

29.



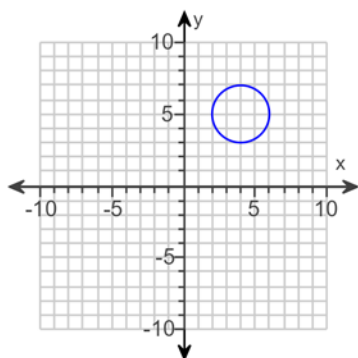
B.

30. D. $(-\infty, 12]$ 31. A. $5x + 2$ 32. D. $\frac{5x^2 - 8x}{x^2 - 4x - 32}$ 33. C. $-7x + 12$ 34. C. $40x^2 - 3x - 54$ 35. D. $-20x + 29$ 36. C. $\frac{35x}{2 - 28x}$ 37. B. x

38. A. 13

39. C. $\left(-\frac{13}{2}, -\frac{5}{2}\right)$

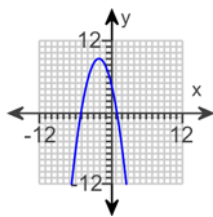
40.



Domain: [2,6], Range: [3,7]

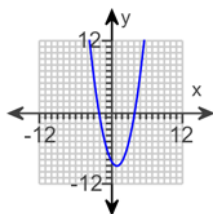
41. B. $(x+7)^2 + (y-4)^2 = 16$ Center: $(-7,4)$, radius: 4

42.



A.

43.



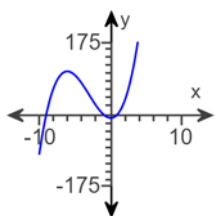
A.

44. B. 300 pretzels

45. C. 256 ft

46. A. 50 ft

47.



C.

48. D. $x = 0$, $x = -3$, $x = 2$ 49. C. $x = -1$, $x = 1$, $x = -4$ 50. B. $\{3, -2, 4\}$ 51. B. -1 ; The remainder is zero; -1 , -2 , and -3 , or $\{-3, -2, -1\}$ 52. B. $\{-3, -1, 2\}$ 53. B. $\{-2, -2 + \sqrt{7}, -2 - \sqrt{7}\}$ 54. A. $\{-2, 2 + 3i, 2 - 3i\}$ 55. D. $\{-3, -2, 2\}$ 56. B. $x = 3$, $x = -3$ 57. B. $y = \frac{8}{3}$ 58. C. $y = x - 13$

59. D. 3,480,000

60. B. 238

61. C. $(-1, \infty)$ 62. D. $\log_b x + 2 \log_b y - 3 \log_b z$

63. C. $\frac{1}{5} \log_9 m + \frac{1}{4} \log_9 n - 2 \log_9 k$

64. B. $4 \log_a x + \frac{1}{3} \log_a (x+5) - 2 \log_a (x-2)$

65. B. {2}

66. D. {3}

67. A. {-3}

68. C. $\left\{ \frac{\ln 4.5}{9 \ln 7} \right\}$

69. B. $\left\{ \frac{\ln 3}{\ln 2} - 7 \right\}$

70. D. $\ln 5 - 7$

71. C. 0.41

72. A. 1.65

73. B. 0.17

74. A. 0.65

75. C. {13}

76. B. $\left\{ \frac{1}{12} \right\}$

77. D. $\left\{ \frac{7}{6} \right\}$

78. B. $\left\{ \frac{17}{4} \right\}$

79. A. {8}

80. A. {8}

81. C. {8}

82. D. {6}

83. B. 7.8 years

84. D. 226

85. C. 154 pounds

86. B. 50 years

87. C. 41.215

88. B. 36 years

89. B. $\{(3, -5, -3)\}$

90. B. $\{(8, 5)\}$

91. C. $\{(2, -2, -5)\}$

92. D. $\begin{bmatrix} 3 & -7 & 2 \\ 6 & -28 & 32 \end{bmatrix}$

93. D. -25

94. A. $\{(4,9,5)\}$

95. B. 108

96. B. 38

97. C. 30

98. A. 4,277

99. B. 5,456

100. B. $27x^3 + 54x^2 + 36x + 8$

101. D. $16x^4 + 96x^3 + 216x^2 + 216x + 81$

102. C. $x^{17} + 34x^{16} + 544x^{15}$
