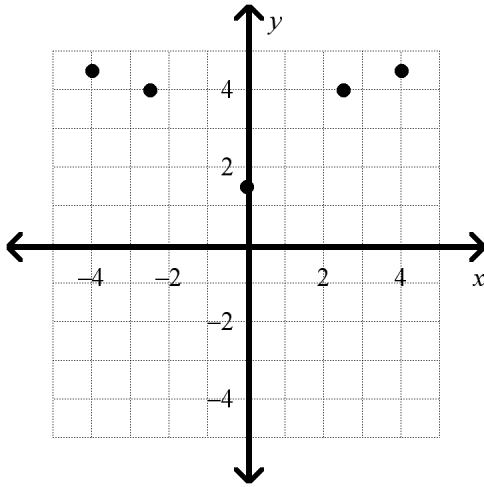
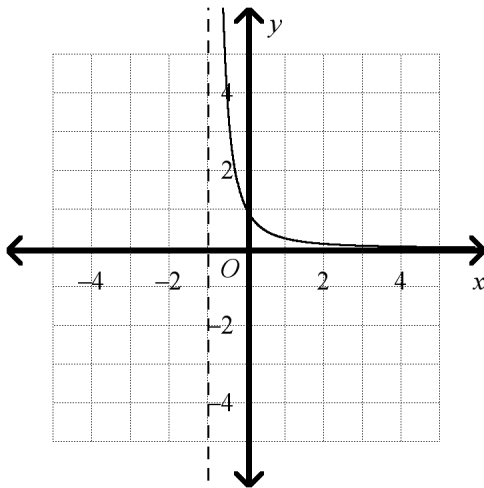


Algebra 2, Fall Semester Exam Review

1. Find the domain and range of the relation.



2. Find the domain and range of the relation and determine whether it is a function.



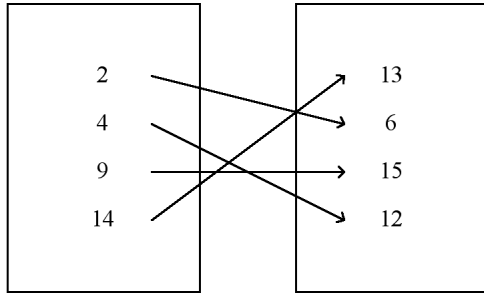
1

Is the relation a function?

_____ 3. $\{(14, 15), (5, 7), (3, 10), (11, 1), (5, 8)\}$

- a. yes
- b. no

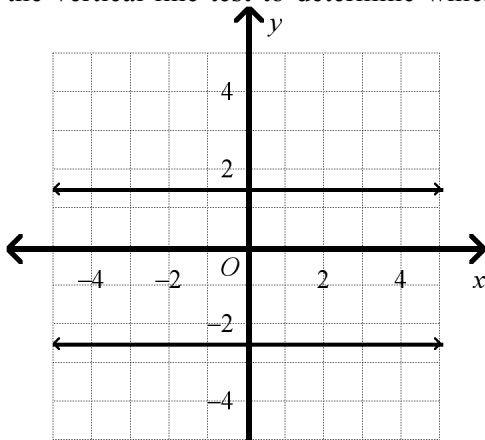
_____ 4.



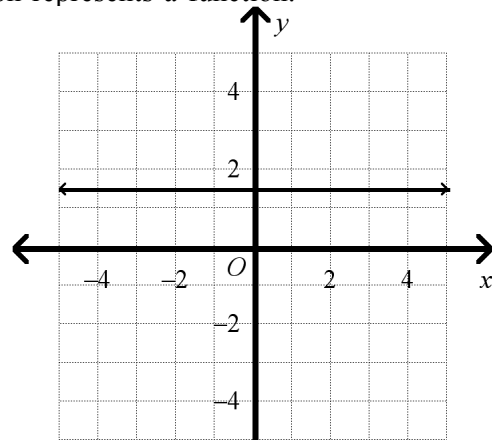
- a. yes
- b. no

_____ 5. Use the vertical-line test to determine which graph represents a function.

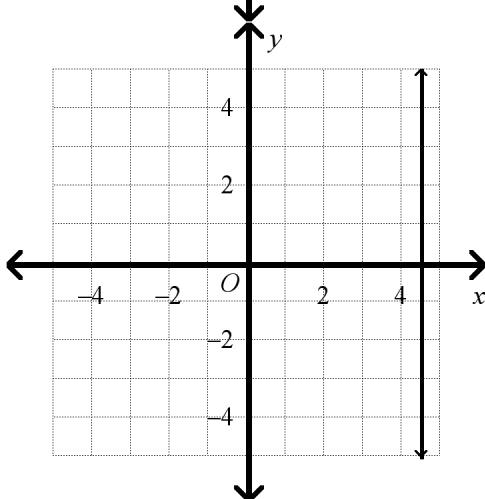
a.



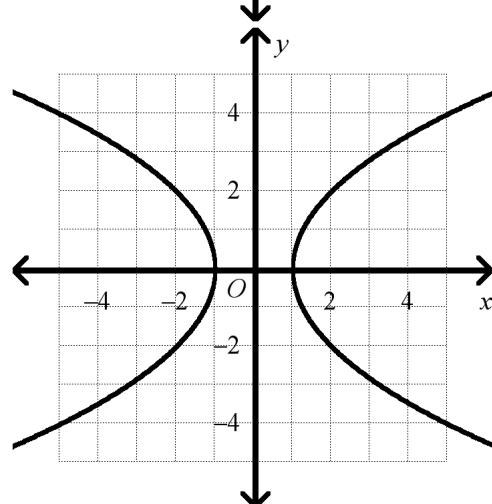
c.



b.



d.



For each function, what is the output of the given input?

6. For $f(x) = 5x + 1$, find $f(-4)$.

Name: _____

ID: A

7. For $f(x) = -5x + 1$, find $f(3)$.

_____ 8. Specialty t-shirts are being sold online for \$35 plus a one-time handling fee of \$1.75. The total cost is a function of the number of t-shirts bought. What function rule models the cost of the t-shirts? Evaluate the function for 6 t-shirts.

a. $1.75t + 35$; \$211.75

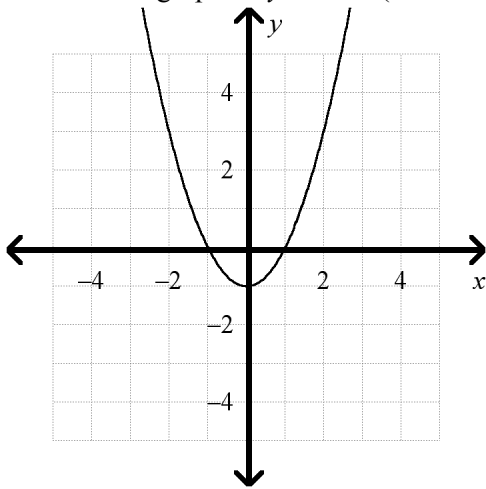
c. $1.75t + 35$; \$45.5

b. $35t + 1.75$; \$211.75

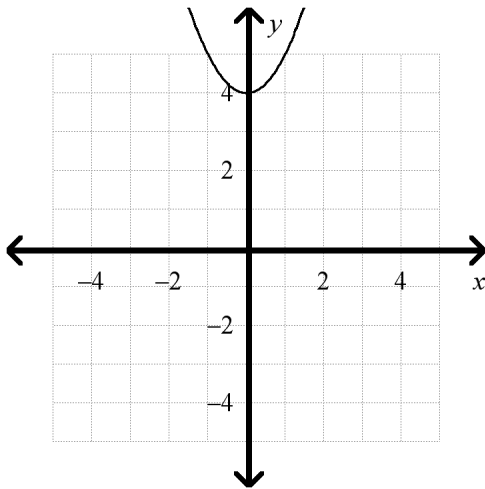
d. $35t + 1.75$; \$45.5

9. A candle is 16 in. tall after burning for 3 hours. After 5 hours, it is 15.5 in. tall. Write a linear equation to model the relationship between height h of the candle and time t . Predict how tall the candle will be after burning 2 hours.

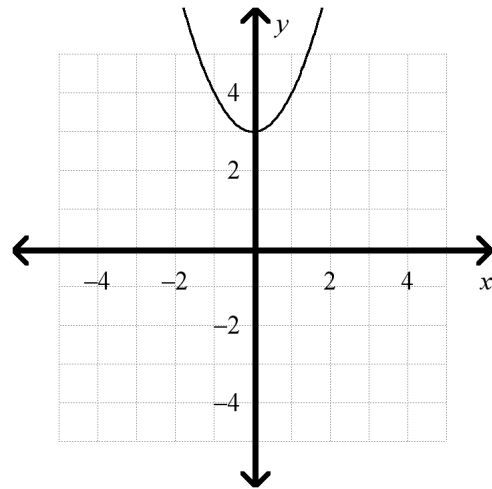
_____ 10. What is the graph of $y = x^2 - 1$ (shown below) translated up 4 units?



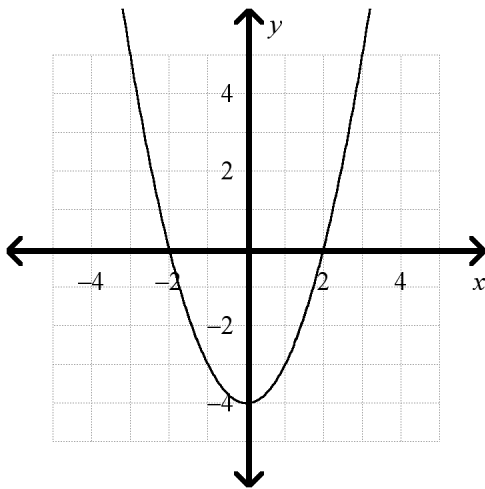
a.



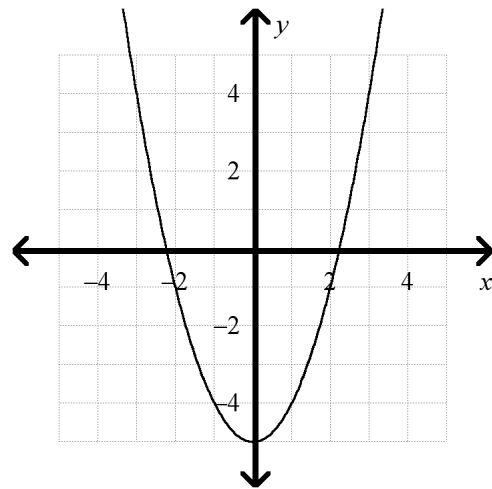
c.



b.



d.



- _____ 11. If a function, $f(x)$ is shifted to the left one unit(s), what function represents the transformation?
- a. $f(x + 1)$ c. $f(x) + 1$
 b. $f(x - 1)$ d. $f(x) - 1$

Let $g(x)$ be the reflection of $f(x)$ in the y -axis. What is the function rule for $g(x)$?

12. Let $g(x)$ be the reflection of $f(x) = 6x + 9$ in the y -axis. What is a function rule for $g(x)$?
13. Let $g(x)$ be the reflection of $f(x) = x^2 + 5$ in the x -axis. What is a function rule for $g(x)$?

The function $f(x)$ is represented by the given table. What are the corresponding values of the given $g(x)$?

14. Write an equation for the following transformation of $y = x$:
 a vertical stretch by a factor of 4

Find the function rule for $g(x)$.

15. The function $f(x) = -2x$. The graph of $g(x)$ is $f(x)$ vertically compressed by a factor of $\frac{1}{8}$ and reflected in the x -axis. What is the function rule for $g(x)$?
16. The function $f(x) = x^2$. The graph of $g(x)$ is $f(x)$ translated to the left 5 units and up 3 units. What is the function rule for $g(x)$?

What transformations change the graph of $f(x)$ to the graph of $g(x)$?

17. $f(x) = -7x^2$ $g(x) = -35x^2 + 5$
18. $f(x) = x^2$; $g(x) = (x - 9)^2 - 6$

What is the maximum or minimum value of the function? What is the range?

19. $y = 2x^2 + 4x - 16$
20. $y = -2x^2 + 20x - 2$

What is the expression in factored form?

21. $x^2 + 14x + 48$

22. $x^2 - 6x + 8$

23. $-x^2 - x + 42$

What is the expression in factored form?

24. $16x^2 + 8x$

25. $2x^2 + 16x + 30$

26. $-4x^2 + 16x + 48$

27. $3x^2 + 26x + 35$

28. $9x^2 - 18x + 9$

29. $16x^2 - 25$

What are the solutions of the quadratic equation?

30. $x^2 + 11x = -28$

31. $x^2 - 12x + 32 = 0$

32. $3x^2 + 25x + 42 = 0$

33. $4x^2 - 18x + 20 = 0$

What is the solution of each equation?

34. $3x^2 = 21$

35. $108x^2 = 147$

Use the Quadratic Formula to solve the equation.

36. $-x^2 + 6x - 5 = 0$

37. $-2x^2 - 5x + 5 = 0$

38. $2x^2 + x - 4 = 0$

39. $-4x^2 + x = -4$

What is the number of real solutions?

_____ 40. $-x^2 + 9x + 7 = 0$

- a. one solution
b. no real solutions
c. two solutions
d. cannot be determined

_____ 41. $8x^2 - 11x = -3$

- a. one real solution
b. two real solutions
c. no real solutions
d. cannot be determined

_____ 42. $x^2 = -7x + 7$

- a. one solution
b. no real solutions
c. two solutions
d. cannot be determined

_____ 43. $-4x^2 - 4 = 8x$

- a. one solution
b. two solutions
c. no real solutions
d. cannot be determined

Simplify the number using the imaginary unit i .

44. $\sqrt{-144}$

45. $\sqrt{-360}$

Simplify the expression.

46. $(-1 + 6i) + (-4 + 2i)$

47. $(2 - 5i) - (3 + 4i)$

48. $(-5i)(6i)$

49. $(6 - 4i)(-1 + 6i)$

50. $\frac{-1 + 3i}{4 - i}$

51. $\frac{2-5i}{6i}$

What are the solutions?

52. $9x^2 + 16 = 0$

53.

$\frac{1}{2}x^2 - x + 5 = 0$

54. Classify $-6x^5 + 4x^3 + 3x^2 + 11$ by degree.55. Classify $8x^4 + 7x^3 + 5x^2 + 8$ by number of terms.56. Write $-2x^2(-5x^2 + 4x^3)$ in standard form.

Consider the leading term of each polynomial function. What is the end behavior of the graph?

_____ 57. $2x^3 + 5x$

- The leading term is $2x^3$. Since n is odd and a is positive, the end behavior is up and up.
- The leading term is $2x^3$. Since n is odd and a is positive, the end behavior is up and down.
- The leading term is $2x^3$. Since n is odd and a is positive, the end behavior is down and down.
- The leading term is $2x^3$. Since n is odd and a is positive, the end behavior is down and up.

_____ 58. $5x^8 - 2x^7 - 8x^6 + 1$

- The leading term is $5x^8$. Since n is even and a is positive, the end behavior is down and up.
- The leading term is $5x^8$. Since n is even and a is positive, the end behavior is up and down.
- The leading term is $5x^8$. Since n is even and a is positive, the end behavior is up and up.
- The leading term is $5x^8$. Since n is even and a is positive, the end behavior is down and down.

Write the polynomial in factored form.

59. $4x^3 + 8x^2 - 96x$

60. $x^3 + 9x^2 + 18x$

What are the zeros of the function? Graph the function.

61. $y = x(x - 2)(x + 5)$

62. $y = (x + 3)(x - 3)(x - 4)$

_____ 63. What is a cubic polynomial function in standard form with zeros 5, 2, and -5 ?

a. $f(x) = x^3 + 2x^2 + 25x + 50$

c. $f(x) = x^3 - 2x^2 - 25x + 50$

b. $f(x) = x^3 + 2x^2 - 25x + 10$

d. $f(x) = x^3 + 2x^2 + 17x + 50$

_____ 64. What is a quadratic polynomial function in standard form with zeros -3 , -4 , 1 , and 3 ?

a. $g(x) = x^4 + 3x^3 - 13x^2 - 27x + 36$

c. $g(x) = x^4 + 3x^3 - x^2 - 6x + 36$

b. $g(x) = x^4 - 3x^3 + 13x^2 + 27x + 36$

d. $g(x) = x^4 - 3x^3 - x^2 + 27x + 36$

What are the zeros of the function? What are their multiplicities?

_____ 65. $f(x) = x^4 - 4x^3 + 3x^2$

a. the numbers -1 and -3 are zeros of multiplicity 2; the number 0 is a zero of multiplicity 1

b. the number 0 is a zero of multiplicity 2; the numbers 1 and 3 are zeros of multiplicity 1

c. the numbers 0 and 1 are zeros of multiplicity 2; the number 3 is a zero of multiplicity 1

d. the number 0 is a zero of multiplicity 2; the numbers -1 and -3 are zeros of multiplicity 1

_____ 66. $f(x) = 4x^3 - 12x^2 - 16x$

a. the numbers 1, -4 , and 0 are zeros of multiplicity 2

b. the numbers -1 , 4, and 0 are zeros of multiplicity 2

c. the numbers -1 , 4, and 0 are zeros of multiplicity 1

d. the numbers 1, -4 , and 0 are zeros of multiplicity 1

What is the relative maximum and minimum of the function?

67. $f(x) = x^3 + 6x^2 - 36x$

68. $f(x) = 2x^3 + x^2 - 11x$

What are the real or imaginary solutions of each polynomial equation?

69. $x^4 - 40x^2 + 144 = 0$

What are the real or imaginary solutions of the polynomial equation?

70. $x^4 - 20x^2 + 64 = 0$

71. Divide $4x^3 + 2x^2 + 3x + 4$ by $x + 4$.

72. Divide $-3x^3 - 2x^2 - x - 2$ by $x - 2$.

73. Divide $x^3 + x^2 - x + 2$ by $x + 4$.

_____ 74. Determine which binomial is *not* a factor of $4x^4 - 21x^3 - 46x^2 + 219x + 180$.

a. $x + 4$

c. $x - 5$

b. $x + 3$

d. $4x + 3$

_____ 75. Is $(x - 2)$ a factor of $P(x) = x^3 + 2x^2 - 6x - 4$? If it is, write $P(x)$ as a product of two factors.

a. yes:

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

c. yes:

$P(x) = (x - 2)(x^2 - 4x + 2)$

b. yes:

$P(x) = (x - 2)(x^2 + 4x + 2)$

d. $(x - 2)$ is not a factor of $P(x)$

Find all the zeros of the equation.

76. $x^5 - 3x^4 - 24x^3 - 72x^2 - 25x + 75 = 0$

77. $-3x^5 + 3x^4 + 9x^3 - 7x^2 + 12x = 12$

78. $x^3 - x^2 - 13x - 13 = 0$

79. $7x^2 - 144 = -x^4$

What is the simplified form of each expression?

80. $(-5.1)^0$

81. $-(10)^{-1}$

What is the simplified form of each expression?

82. $4c^{-1} \cdot 3c^{10}$

83. $(-2x^8) \cdot 3y^9 \cdot 2x^4$

What is the simplified form of the expression?

84. $(m^7)^2$

85. $(y^{-5})^{-10} y^{10}$

What is the simplified form of each expression?

86. $(3q^2)^4$

87. Find all the real square roots of 0.0004.

88. Find all the real cube roots of 0.000027.

Find the real-number root.

89. $\sqrt{1.69}$

90. $\sqrt{-2.56}$

What is a simpler form of the radical expression?

91. $\sqrt{36g^6}$

92. $\sqrt[4]{81x^{20}y^8}$

93. $\sqrt[3]{27x^{15}y^{24}}$

Multiply and simplify if possible.

94. $\sqrt{6} \cdot \sqrt{2}$

95. $\sqrt[4]{11} \cdot \sqrt[4]{3}$

96. $\sqrt{7x}(\sqrt{x} - 7\sqrt{7})$

What is the simplest form of the expression?

97. $\sqrt[3]{128a^{13}b^6}$

98. $\sqrt[3]{108a^{16}b^9}$

What is the simplest form of the product?

99. $\sqrt[3]{7x^7} \cdot \sqrt[3]{9x^4}$

100. $\sqrt{50x^7y^7} \cdot \sqrt{6xy^4}$

What is the simplest form of the quotient?

101. $\frac{\sqrt[3]{162}}{\sqrt[3]{2}}$

102. $\frac{\sqrt[4]{400}}{\sqrt[4]{5}}$

103. $\frac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}}$

104. $\frac{\sqrt{6x^8y^9}}{\sqrt{5x^2y^4}}$

What is the simplest form of the radical expression?

105. $2\sqrt[4]{2x} + 6\sqrt[4]{2x}$

106. $4\sqrt[3]{3x} + 5\sqrt[3]{10x}$

107. $3\sqrt{2a} - 6\sqrt{2a}$

What is the simplest form of the expression?

- ____ 108. $\sqrt{20} + \sqrt{45} - \sqrt{5}$
a. $4\sqrt{5}$ c. $13\sqrt{5}$
b. $6\sqrt{5}$ d. $5\sqrt{5}$
- ____ 109. $\sqrt[3]{48} + \sqrt[3]{2058} - \sqrt[3]{750}$
a. $4\sqrt[3]{6}$ c. $2.8\sqrt[3]{6}$
b. $14\sqrt[3]{6}$ d. $9\sqrt[3]{6}$

What is the product of the radical expression?

110. $(7 - \sqrt{2})(8 + \sqrt{2})$
111. $(-5 - \sqrt{3})^2$

How can you write the expression with rationalized denominator?

112. $\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$
113. $\frac{2 + \sqrt[3]{3}}{\sqrt[3]{6}}$

Simplify.

114. $20^{\frac{1}{2}} \cdot 20^{\frac{1}{2}}$
115. $3^{\frac{1}{3}} \cdot 9^{\frac{1}{3}}$
- ____ 116. $16^{\frac{1}{2}}$
a. 16^2 c. $\sqrt{16^2}$
b. 4 d. 16

117. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

118.

Write the radical expression $\frac{8}{\sqrt[7]{x^{15}}}$ in exponential form.

_____ 119. What is $\frac{\sqrt[3]{x^3}}{\sqrt[5]{x^2}}$ in simplest form?

a. $x^{\frac{3}{5}}$

c. $x^{\frac{9}{15}}$

b. $x^{\frac{5}{3}}$

d. $x^{\frac{15}{9}}$

What is the simplest form of the number?

_____ 120. $\sqrt{2}(\sqrt[8]{2})$

a. 1024

c. $2^{\frac{8}{5}}$

b. $2^{\frac{5}{8}}$

d. $2^{\frac{1}{10}}$

_____ 121. $-27^{\frac{2}{3}}$

a. 9

c. -28

b. 57

d. -18

What is the solution of the equation?

122. $\sqrt{x+10} - 7 = -5$

123. $-10 + \sqrt{x+8} = -4$

124. $(x+6)^{\frac{3}{5}} = 8$

125. $\sqrt{3x+28} - 8 = x$

126. Let $f(x) = -2x - 7$ and $g(x) = -4x + 3$. Find $(f \circ g)(-5)$.

127. Let $f(x) = x^2 + 6$ and $g(x) = \frac{x+8}{x}$. Find $(g \circ f)(-7)$.

128. Let $f(x) = x + 2$ and $g(x) = x^2$. Find $(g \circ f)(-5)$.

129. Graph the relation and its inverse. Use open circles to graph the points of the inverse.

x	0	4	9	10
y	3	2	7	-1

130. Is relation t a function? Is the inverse of relations t a function?Relation t

x	0	2	4	6
y	-8	-7	-4	-4

What is the inverse of the given relation?

131. $y = 7x^2 - 3$.

132. $y = 3x + 9$

133. For the function $f(x) = (8 - 2x)^2$, find f^{-1} . Determine whether f^{-1} is a function.134. For the function $f(x) = \sqrt{x - 5}$, find f^{-1} . What is the range of f^{-1} ?**Graph the equation.**

135. $y = \sqrt{x} - 3$

136. $y = \sqrt{x + 3}$

137. $y = -0.5\sqrt{x - 2} + 2$

138. $y = \sqrt[3]{x - 1} + 1$

Graph the exponential function.

139. $y = 3(1.9)^x$

140. Find the annual percent increase or decrease that $y = 0.35(2.3)^x$ models.
141. An initial population of 820 quail increases at an annual rate of 23%. Write an exponential function to model the quail population. What will the approximate population be after 3 years?
142. The half-life of a certain radioactive material is 32 days. An initial amount of the material has a mass of 361 kg. Write an exponential function that models the decay of this material. Find how much radioactive material remains after 5 days. Round your answer to the nearest thousandth.
143. The half-life of a certain radioactive material is 71 hours. An initial amount of the material has a mass of 722 kg. Write an exponential function that models the decay of this material. Find how much radioactive material remains after 17 hours. Round your answer to the nearest thousandth.
144. A boat costs \$11,850 and decreases in value by 10% per year. How much will the boat be worth after 8 years?

Find the balance in the account.

145. \$1,600 principal earning 7%, compounded semi-annually, after 33 years
146. \$1,000 principal earning 6.25%, compounded quarterly, after 7 years
147. Suppose you invest \$1600 at an annual interest rate of 4.6% compounded continuously. How much will you have in the account after 4 years?
148. How much money invested at 5% compounded continuously for 3 years will yield \$820?

Write the equation in logarithmic form.

149. $2^5 = 32$
150. $125^{\frac{4}{3}} = 625$

Evaluate the logarithm.

151. $\log_5 \frac{1}{625}$
152. $\log_3 243$
153. $\log 0.01$

154. The pH of a liquid is a measure of how acidic or basic it is. The concentration of hydrogen ions in a liquid is labeled $[H^+]$. Use the formula $\text{pH} = -\log[H^+]$ to find the pH level, to the nearest tenth, of a liquid with $[H^+]$ about 6.5×10^{-3} .

Graph the logarithmic equation.

155. $y = \log_3 x$

Write the expression as a single logarithm.

156. $3 \log_b q + 6 \log_b v$

157. $\log_3 4 - \log_3 2$

158. $4 \log x - 6 \log (x + 2)$

Expand the logarithmic expression.

159. $\log_3 \frac{d}{12}$

160. $\log_3 11p^3$

161. $\log_b \sqrt{\frac{57}{74}}$

162. Use the Change of Base Formula to evaluate $\log_4 20$.

163. Use the Change of Base Formula to evaluate $\log_7 28$.

_____ 164. What is the value of $\log_{81} 3$?

a. 3

c. 4

b. $\frac{1}{4}$

d. $\frac{1}{3}$

165. A construction explosion has an intensity I of 4.85×10^{-2} W/m². Find the loudness of the sound in decibels if $L = 10 \log \frac{I}{I_0}$ and $I_0 = 10^{-12}$ W/m². Round to the nearest tenth.

To which set of numbers does the number belong?

____ 166. $\sqrt{51}$

- a. rational numbers
- b. irrational numbers
- c. integers
- d. natural numbers

____ 167. -55

- a. natural numbers
- b. whole numbers
- c. integers
- d. irrational numbers

____ 168. $-\frac{2}{15}$

- a. integers
- b. rational numbers
- c. irrational numbers
- d. natural numbers

Which algebraic expression models the given word phrase?

____ 169. 40 fewer than a number t

- a. $-40t$
- b. $t+40$
- c. $40-t$
- d. $t-40$

____ 170. 5 times the sum of a and b

- a. $5a+b$
- b. $5(a+b)$
- c. $a+b$
- d. $5(a-b)$

Evaluate the expression for the given value of the variable(s).

____ 171. $5a + 5b; a = -6, b = -5$

- a. -55
- b. 55
- c. 5
- d. -5

____ 172. $|4b - 4| + |3 - b^2| + 2b^3; b = 2$

- a. 19
- b. 17
- c. -11
- d. 21

Name: _____

ID: A

Solve the equation.

_____ 173. $3y + 20 = 3 + 2y$

a. $-\frac{1}{17}$

b. $7\frac{2}{3}$

c. 23

d. -17

_____ 174. $-5y - 9 = -(y - 1)$

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

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

c. -2

d. $-\frac{2}{5}$

Algebra 2, Fall Semester Exam Review Answer Section

1. ANS:
domain: $\{-4, -2.5, 0, 2.5, 4\}$; range: $\{4.5, 4, 1.5\}$

PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.1 To graph relations NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 1 Representing a Relation
KEY: domain | range | relation DOK: DOK 1
2. ANS:
domain: $x > -1$; range: $y > 0$; Yes, it is a function.

PTS: 1 DIF: L3 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 2 Finding Domain and Range
KEY: domain | range | relation | function DOK: DOK 2
3. ANS: B PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 3 Identifying Functions
KEY: function | relation DOK: DOK 1
4. ANS: A PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 3 Identifying Functions
KEY: function | relation DOK: DOK 1
5. ANS: C PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 4 Using the Vertical-Line Test
KEY: graphing | vertical-line test | function DOK: DOK 1
6. ANS:
-19

PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 5 Using Function Notation
KEY: function notation DOK: DOK 1
7. ANS:
-14

PTS: 1 DIF: L2 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 5 Using Function Notation
KEY: function notation DOK: DOK 1
8. ANS: B PTS: 1 DIF: L3 REF: 2-1 Relations and Functions
OBJ: 2-1.2 To identify functions NAT: A.1.g| A.1.i| A.2.b| A.3.f
STA: L1.2.1| A2.1.1| A2.1.2| A2.1.3 TOP: 2-1 Problem 6 Writing and Evaluating a Function
KEY: function rule DOK: DOK 2

9. ANS:

$$h(t) = -0.25t + 16.75; 16.25 \text{ inches}$$

PTS: 1 DIF: L3 REF: 2-5 Using Linear Models
 OBJ: 2-5.2 To make predictions from linear models NAT: A.2.e| D.1.c| D.2.e| D.2.f| D.5.d
 STA: A2.4.3 TOP: 2-5 Problem 2 Writing the Equation of a Trend Line
 DOK: DOK 3

10. ANS: C PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 1 Vertical Translation KEY: translation
 DOK: DOK 2

11. ANS: A PTS: 1 DIF: L2 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 2 Horizontal Translation KEY: translation | transformation
 DOK: DOK 2

12. ANS:

$$g(x) = -6x + 9$$

PTS: 1 DIF: L2 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 3 Reflecting a Function Algebraically KEY: transformation
 DOK: DOK 2

13. ANS:

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

PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 3 Reflecting a Function Algebraically KEY: transformation
 DOK: DOK 2

14. ANS:

$$y = 4x$$

PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 4 Stretching and Compressing a Function KEY: transformation
 DOK: DOK 3

15. ANS:

$$g(x) = -\frac{1}{4}x$$

PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 5 Combining Transformations KEY: transformation
 DOK: DOK 2

16. ANS:

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

PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 5 Combining Transformations KEY: transformation
 DOK: DOK 2

17. ANS:

The graph of $g(x)$ is the graph of $f(x)$ stretched vertically by a factor of 5 and translated up 5 units.

PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 5 Combining Transformations KEY: transformation
 DOK: DOK 2

18. ANS:

The graph of $g(x)$ is the graph of $f(x)$ translated to the right 9 units and down 6 units.

PTS: 1 DIF: L3 REF: 2-6 Families of Functions
 OBJ: 2-6.1 To analyze transformations of functions NAT: G.2.c| G.4.d| A.1.e| A.1.h| A.2.b
 STA: A2.4.1| A2.1.7| A2.4.2| A2.3.1| A2.3.3
 TOP: 2-6 Problem 5 Combining Transformations KEY: transformation
 DOK: DOK 2

19. ANS:

minimum value: -9
 range: $y \geq -9$

PTS: 1 DIF: L2 REF: 4-2 Standard Form of a Quadratic Function
 OBJ: 4-2.1 To graph quadratic functions written in standard form
 STA: A2.1.3 TOP: 4-2 Problem 1 Finding the Features of a Quadratic Function
 KEY: standard form DOK: DOK 2

20. ANS:
 maximum: 24
 range: $y \leq 24$
- PTS: 1 DIF: L3 REF: 4-2 Standard Form of a Quadratic Function
 OBJ: 4-2.1 To graph quadratic functions written in standard form
 STA: A2.1.3 TOP: 4-2 Problem 1 Finding the Features of a Quadratic Function
 KEY: standard form DOK: DOK 2
21. ANS:
 $(x + 6)(x + 8)$
- PTS: 1 DIF: L2 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 1 Factoring ax^2+bx+c when $a=\pm 1$
 KEY: factor a quadratic expression | quadratic expression DOK: DOK 2
22. ANS:
 $(x - 2)(x - 4)$
- PTS: 1 DIF: L2 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 1 Factoring ax^2+bx+c when $a=\pm 1$
 KEY: factor a quadratic expression | quadratic expression DOK: DOK 2
23. ANS:
 $-(x - 6)(x + 7)$
- PTS: 1 DIF: L3 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 1 Factoring ax^2+bx+c when $a=\pm 1$
 KEY: factor a quadratic expression | quadratic expression DOK: DOK 2
24. ANS:
 $4x(4x + 2)$
- PTS: 1 DIF: L2 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 2 Finding Common Factors
 KEY: factoring | greatest common factor DOK: DOK 2
25. ANS:
 $2(x + 3)(x + 5)$
- PTS: 1 DIF: L3 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 2 Finding Common Factors
 KEY: factoring | greatest common factor DOK: DOK 2

26. ANS:
 $-4(x - 6)(x + 2)$

PTS: 1 DIF: L3 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 2 Finding Common Factors
 KEY: factoring | greatest common factor DOK: DOK 2

27. ANS:
 $(3x + 5)(x + 7)$

PTS: 1 DIF: L3 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.1 To find common and binomial factors of quadratic expressions
 NAT: N.5.c| A.2.a TOP: 4-4 Problem 3 Factoring ax^2+bx+c when $abs(a)<1$
 KEY: factoring DOK: DOK 2

28. ANS:
 $(3x - 3)^2$

PTS: 1 DIF: L3 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.2 To factor special quadratic expressions NAT: N.5.c| A.2.a
 TOP: 4-4 Problem 4 Factoring a Perfect Square Trinomial KEY: factoring | perfect square trinomial
 DOK: DOK 2

29. ANS:
 $(4x + 5)(4x - 5)$

PTS: 1 DIF: L2 REF: 4-4 Factoring Quadratic Expressions
 OBJ: 4-4.2 To factor special quadratic expressions NAT: N.5.c| A.2.a
 TOP: 4-4 Problem 5 Factoring a Difference of Two Squares
 KEY: difference of two squares | factoring DOK: DOK 2

30. ANS:
 $-4, -7$

PTS: 1 DIF: L2 REF: 4-5 Quadratic Equations
 OBJ: 4-5.1 To solve quadratic equations by factoring NAT: A.2.a| A.4.a| A.4.c
 TOP: 4-5 Problem 1 Solving a Quadratic Equation by Factoring
 DOK: DOK 2

31. ANS:
 $4, 8$

PTS: 1 DIF: L3 REF: 4-5 Quadratic Equations
 OBJ: 4-5.1 To solve quadratic equations by factoring NAT: A.2.a| A.4.a| A.4.c
 TOP: 4-5 Problem 1 Solving a Quadratic Equation by Factoring
 DOK: DOK 2

32. ANS:

$$-6, -\frac{7}{3}$$

PTS: 1 DIF: L3 REF: 4-5 Quadratic Equations
 OBJ: 4-5.1 To solve quadratic equations by factoring NAT: A.2.a| A.4.a| A.4.c
 TOP: 4-5 Problem 1 Solving a Quadratic Equation by Factoring
 DOK: DOK 2

33. ANS:

$$2, \frac{5}{2}$$

PTS: 1 DIF: L3 REF: 4-5 Quadratic Equations
 OBJ: 4-5.1 To solve quadratic equations by factoring NAT: A.2.a| A.4.a| A.4.c
 TOP: 4-5 Problem 1 Solving a Quadratic Equation by Factoring
 DOK: DOK 2

34. ANS:

$$\sqrt{7}, -\sqrt{7}$$

PTS: 1 DIF: L2 REF: 4-6 Completing the Square
 OBJ: 4-6.1 To solve equations by completing the square NAT: A.2.a| A.4.c| A.4.g
 TOP: 4-6 Problem 1 Solving by Finding Square Roots DOK: DOK 2

35. ANS:

$$-\frac{7}{6}, \frac{7}{6}$$

PTS: 1 DIF: L3 REF: 4-6 Completing the Square
 OBJ: 4-6.1 To solve equations by completing the square NAT: A.2.a| A.4.c| A.4.g
 TOP: 4-6 Problem 1 Solving by Finding Square Roots DOK: DOK 2

36. ANS:

$$1, 5$$

PTS: 1 DIF: L2 REF: 4-7 The Quadratic Formula
 OBJ: 4-7.1 To solve quadratic equations using the Quadratic Formula
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 1 Using the Quadratic Formula
 KEY: Quadratic Formula DOK: DOK 2

37. ANS:

$$-\frac{5}{4} \pm \frac{\sqrt{65}}{4}$$

PTS: 1 DIF: L3 REF: 4-7 The Quadratic Formula
 OBJ: 4-7.1 To solve quadratic equations using the Quadratic Formula
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 1 Using the Quadratic Formula
 KEY: Quadratic Formula DOK: DOK 2

38. ANS:

$$-\frac{1}{4} \pm \frac{\sqrt{33}}{4}$$

PTS: 1 DIF: L3 REF: 4-7 The Quadratic Formula
 OBJ: 4-7.1 To solve quadratic equations using the Quadratic Formula
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 1 Using the Quadratic Formula
 KEY: Quadratic Formula DOK: DOK 2

39. ANS:

$$\frac{1}{8} \pm \frac{\sqrt{65}}{8}$$

PTS: 1 DIF: L3 REF: 4-7 The Quadratic Formula
 OBJ: 4-7.1 To solve quadratic equations using the Quadratic Formula
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 1 Using the Quadratic Formula
 KEY: Quadratic Formula DOK: DOK 2

40. ANS: C PTS: 1 DIF: L2 REF: 4-7 The Quadratic Formula

OBJ: 4-7.2 To determine the number of solutions by using the discriminant
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 3 Using the Discriminant
 KEY: discriminant | Quadratic Formula DOK: DOK 2

41. ANS: B PTS: 1 DIF: L2 REF: 4-7 The Quadratic Formula

OBJ: 4-7.2 To determine the number of solutions by using the discriminant
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 3 Using the Discriminant
 KEY: discriminant | Quadratic Formula DOK: DOK 2

42. ANS: A PTS: 1 DIF: L2 REF: 4-7 The Quadratic Formula

OBJ: 4-7.2 To determine the number of solutions by using the discriminant
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 3 Using the Discriminant
 KEY: discriminant | Quadratic Formula DOK: DOK 2

43. ANS: A PTS: 1 DIF: L2 REF: 4-7 The Quadratic Formula

OBJ: 4-7.2 To determine the number of solutions by using the discriminant
 NAT: A.2.a| A.4.c| A.4.e| A.4.f TOP: 4-7 Problem 3 Using the Discriminant
 KEY: discriminant | Quadratic Formula DOK: DOK 2

44. ANS:

12i

PTS: 1 DIF: L2 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 1 Simplifying a Number using i KEY: imaginary number | imaginary unit
 DOK: DOK 2

45. ANS:

$$6i\sqrt{10}$$

PTS: 1 DIF: L2 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 1 Simplifying a Number using i KEY: imaginary number | imaginary unit
 DOK: DOK 2

46. ANS:
 $-5 + 8i$
- PTS: 1 DIF: L2 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 3 Adding and Subtracting Complex Numbers
 KEY: complex number DOK: DOK 2
47. ANS:
 $-1 - 9i$
- PTS: 1 DIF: L3 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 3 Adding and Subtracting Complex Numbers
 KEY: complex number DOK: DOK 2
48. ANS:
 30
- PTS: 1 DIF: L2 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 4 Multiplying Complex Numbers
 KEY: simplifying a complex number | complex number | multiplying complex numbers
 DOK: DOK 2
49. ANS:
 $18 + 40i$
- PTS: 1 DIF: L3 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 4 Multiplying Complex Numbers KEY: complex number
 DOK: DOK 2
50. ANS:

$$\frac{-7 + 11i}{17}$$
- PTS: 1 DIF: L3 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 5 Dividing Complex Numbers
 KEY: complex number | complex conjugates DOK: DOK 2
51. ANS:

$$\frac{-30 - 12i}{36}$$
- PTS: 1 DIF: L2 REF: 4-8 Complex Numbers
 OBJ: 4-8.1 To identify, graph, and perform operations with complex numbers
 TOP: 4-8 Problem 5 Dividing Complex Numbers
 KEY: complex number | complex conjugates DOK: DOK 2

52. ANS:

$$-\frac{4}{3}i, \frac{4}{3}i$$

PTS: 1 DIF: L2 REF: 4-8 Complex Numbers
 OBJ: 4-8.2 To find complex number solutions of quadratic equations
 NAT: N.5.f| A.4.g STA: L2.1.5 TOP: 4-8 Problem 6 Finding Pure Imaginary Solutions
 KEY: complex number | imaginary number DOK: DOK 2

53. ANS:

$$1 \pm \sqrt{9}i$$

PTS: 1 DIF: L3 REF: 4-8 Complex Numbers
 OBJ: 4-8.2 To find complex number solutions of quadratic equations
 NAT: N.5.f| A.4.g STA: L2.1.5 TOP: 4-8 Problem 7 Finding Imaginary Solutions
 KEY: complex number | imaginary number DOK: DOK 2

54. ANS:

quintic

PTS: 1 DIF: L2 REF: 5-1 Polynomial Functions
 OBJ: 5-1.1 To classify polynomials STA: A2.1.3
 TOP: 5-1 Problem 1 Classifying Polynomials
 KEY: degree of a polynomial | polynomial function | standard form of a polynomial function
 DOK: DOK 1

55. ANS:

polynomial of 4 terms

PTS: 1 DIF: L2 REF: 5-1 Polynomial Functions
 OBJ: 5-1.1 To classify polynomials STA: A2.1.3
 TOP: 5-1 Problem 1 Classifying Polynomials
 KEY: degree of a polynomial | polynomial function | standard form of a polynomial function
 DOK: DOK 1

56. ANS:

$$-8x^5 + 10x^4$$

PTS: 1 DIF: L3 REF: 5-1 Polynomial Functions
 OBJ: 5-1.1 To classify polynomials STA: A2.1.3
 TOP: 5-1 Problem 1 Classifying Polynomials
 KEY: degree of a polynomial | polynomial function | standard form of a polynomial
 DOK: DOK 2

57. ANS: D

PTS: 1

DIF: L2

REF: 5-1 Polynomial Functions

OBJ: 5-1.2 To graph polynomial functions and describe end behavior

STA: A2.1.3 TOP: 5-1 Problem 2 Describing End Behavior of Polynomial Functions

KEY: polynomial | end behavior DOK: DOK 1

58. ANS: C

PTS: 1

DIF: L2

REF: 5-1 Polynomial Functions

OBJ: 5-1.2 To graph polynomial functions and describe end behavior

STA: A2.1.3 TOP: 5-1 Problem 2 Describing End Behavior of Polynomial Functions

KEY: polynomial | end behavior DOK: DOK 1

59. ANS:

$$4x(x - 4)(x + 6)$$

PTS: 1

DIF: L3

REF: 5-2 Polynomials, Linear Factors, and Zeros

OBJ: 5-2.1 To analyze the factored form of a polynomial STA: A1.2.2| A2.1.3| A2.1.6

TOP: 5-2 Problem 1 Writing a Polynomial in Factored Form

DOK: DOK 2

60. ANS:

$$x(x + 3)(x + 6)$$

PTS: 1

DIF: L2

REF: 5-2 Polynomials, Linear Factors, and Zeros

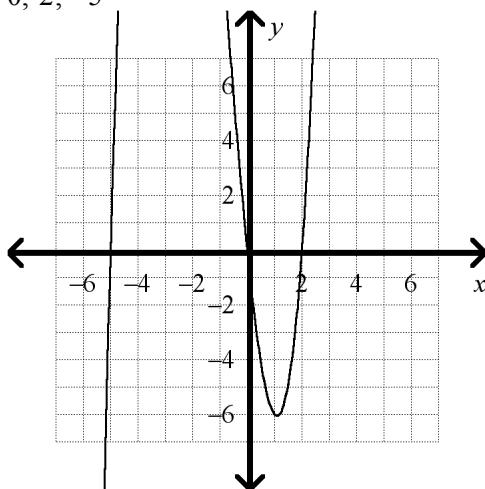
OBJ: 5-2.1 To analyze the factored form of a polynomial STA: A1.2.2| A2.1.3| A2.1.6

TOP: 5-2 Problem 1 Writing a Polynomial in Factored Form

DOK: DOK 2

61. ANS:

0, 2, -5



PTS: 1

DIF: L3

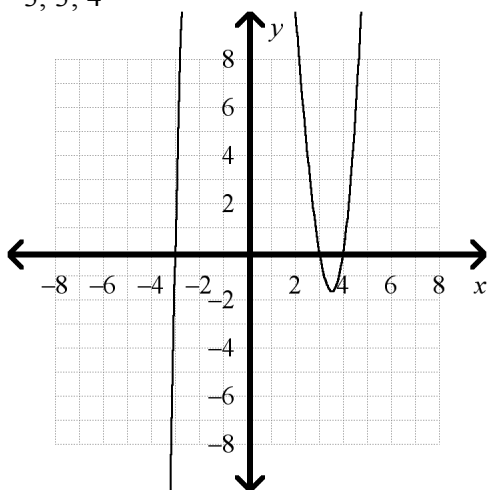
REF: 5-2 Polynomials, Linear Factors, and Zeros

OBJ: 5-2.1 To analyze the factored form of a polynomial STA: A1.2.2| A2.1.3| A2.1.6

TOP: 5-2 Problem 2 Finding Zeros of a Polynomial Function

DOK: DOK 2

62. ANS:
-3, 3, 4



- PTS: 1 DIF: L2 REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.1 To analyze the factored form of a polynomial STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 2 Finding Zeros of a Polynomial Function
DOK: DOK 2
63. ANS: C PTS: 1 DIF: L3
REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.2 To write a polynomial function from its zeros STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 3 Writing a polynomial function from its zeros
DOK: DOK 2
64. ANS: A PTS: 1 DIF: L3
REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.2 To write a polynomial function from its zeros STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 3 Writing a polynomial function from its zeros
DOK: DOK 2
65. ANS: B PTS: 1 DIF: L3
REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.2 To write a polynomial function from its zeros STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 4 Finding the Multiplicity of a Zero DOK: DOK 2
66. ANS: C PTS: 1 DIF: L3
REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.2 To write a polynomial function from its zeros STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 4 Finding the Multiplicity of a Zero DOK: DOK 2
67. ANS:
The relative maximum is at $(-6, 216)$ and the relative minimum is at $(2, -40)$.
- PTS: 1 DIF: L3 REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.1 To analyze the factored form of a polynomial STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 5 Identifying a Relative Maximum and Minimum
KEY: relative maximum | relative minimum DOK: DOK 2

68. ANS:
The relative maximum is at $(-1.53, 12.01)$ and the relative minimum is at $(1.2, -8.3)$.
- PTS: 1 DIF: L3 REF: 5-2 Polynomials, Linear Factors, and Zeros
OBJ: 5-2.1 To analyze the factored form of a polynomial STA: A1.2.2| A2.1.3| A2.1.6
TOP: 5-2 Problem 5 Identifying a Relative Maximum and Minimum
KEY: relative maximum | relative minimum DOK: DOK 2
69. ANS:
 $6, -6, 2, -2$
- PTS: 1 DIF: L2 REF: 5-3 Solving Polynomial Equations
OBJ: 5-3.1 To solve polynomial equations by factoring NAT: A.2.a
STA: A1.2.5 TOP: 5-3 Problem 1 Solving Polynomial Equations Using Factors
DOK: DOK 2
70. ANS:
 $2, -2, 4, -4$
- PTS: 1 DIF: L3 REF: 5-3 Solving Polynomial Equations
OBJ: 5-3.1 To solve polynomial equations by factoring NAT: A.2.a
STA: A1.2.5 TOP: 5-3 Problem 2 Solving Polynomial Equations by Factoring
DOK: DOK 2
71. ANS:
 $4x^2 - 14x + 59, R -232$
- PTS: 1 DIF: L2 REF: 5-4 Dividing Polynomials
OBJ: 5-4.1 To divide polynomials using long division NAT: N.1.d| A.3.c| A.3.e
STA: A1.1.5 TOP: 5-4 Problem 1 Using Polynomial Long Division
DOK: DOK 2
72. ANS:
 $-3x^2 - 8x - 17, R -36$
- PTS: 1 DIF: L3 REF: 5-4 Dividing Polynomials
OBJ: 5-4.1 To divide polynomials using long division NAT: N.1.d| A.3.c| A.3.e
STA: A1.1.5 TOP: 5-4 Problem 1 Using Polynomial Long Division
DOK: DOK 2
73. ANS:
 $x^2 - 3x + 11, R -42$
- PTS: 1 DIF: L2 REF: 5-4 Dividing Polynomials
OBJ: 5-4.1 To divide polynomials using long division NAT: N.1.d| A.3.c| A.3.e
STA: A1.1.5 TOP: 5-4 Problem 1 Using Polynomial Long Division
DOK: DOK 2
74. ANS: A PTS: 1 DIF: L4 REF: 5-4 Dividing Polynomials
OBJ: 5-4.1 To divide polynomials using long division NAT: N.1.d| A.3.c| A.3.e
STA: A1.1.5 TOP: 5-4 Problem 2 Checking Factors DOK: DOK 2

75. ANS: B PTS: 1 DIF: L4 REF: 5-4 Dividing Polynomials
 OBJ: 5-4.1 To divide polynomials using long division NAT: N.1.d| A.3.c| A.3.e
 STA: A1.1.5 TOP: 5-4 Problem 2 Checking Factors DOK: DOK 3
76. ANS:
 3, 5, -5, i , $-i$
- PTS: 1 DIF: L3 REF: 5-6 The Fundamental Theorem of Algebra
 OBJ: 5-6.1 To use the Fundamental Theorem of Algebra to solve polynomial equations with complex solutions STA: A1.2.2| A2.1.6
 TOP: 5-6 Problem 2 Finding All the Zeros of a Polynomial Function
 KEY: Fundamental Theorem of Algebra DOK: DOK 2
77. ANS:
 1, 2, -2, i , $-i$
- PTS: 1 DIF: L4 REF: 5-6 The Fundamental Theorem of Algebra
 OBJ: 5-6.1 To use the Fundamental Theorem of Algebra to solve polynomial equations with complex solutions STA: A1.2.2| A2.1.6
 TOP: 5-6 Problem 2 Finding All the Zeros of a Polynomial Function
 KEY: Fundamental Theorem of Algebra DOK: DOK 2
78. ANS:
 $i\sqrt{13}$, $-i\sqrt{13}$, -1
- PTS: 1 DIF: L2 REF: 5-6 The Fundamental Theorem of Algebra
 OBJ: 5-6.1 To use the Fundamental Theorem of Algebra to solve polynomial equations with complex solutions STA: A1.2.2| A2.1.6
 TOP: 5-6 Problem 2 Finding All the Zeros of a Polynomial Function
 KEY: Rational Root Theorem DOK: DOK 2
79. ANS:
 3, -3, $4i$, $-4i$
- PTS: 1 DIF: L3 REF: 5-6 The Fundamental Theorem of Algebra
 OBJ: 5-6.1 To use the Fundamental Theorem of Algebra to solve polynomial equations with complex solutions STA: A1.2.2| A2.1.6
 TOP: 5-6 Problem 2 Finding All the Zeros of a Polynomial Function
 KEY: Fundamental Theorem of Algebra DOK: DOK 2
80. ANS:
 1
- PTS: 1 DIF: L2 REF: 7-1 Zero and Negative Exponents
 OBJ: 7-1.1 To simplify expressions involving zero and negative exponents
 NAT: N.1.d| N.3.a| A.3.c| A.3.h STA: L1.1.4| L2.1.2| A1.1.2
 TOP: 7-1 Problem 1 Simplifying Powers DOK: DOK 1

81. ANS:

$$-\frac{1}{10}$$

PTS: 1 DIF: L2 REF: 7-1 Zero and Negative Exponents

OBJ: 7-1.1 To simplify expressions involving zero and negative exponents

NAT: N.1.d| N.3.a| A.3.c| A.3.h STA: L1.1.4| L2.1.2| A1.1.2

TOP: 7-1 Problem 1 Simplifying Powers DOK: DOK 1

82. ANS:

$$12c^9$$

PTS: 1 DIF: L2 REF: 7-3 Multiplying Powers With the Same Base

OBJ: 7-3.1 To multiply powers with the same base NAT: N.1.d| N.1.f| N.3.a| A.3.c| A.3.h

STA: L1.1.4| L2.1.2| A1.1.2

TOP: 7-3 Problem 2 Multiplying Powers in Algebraic Expressions

DOK: DOK 1

83. ANS:

$$-12x^{12}y^9$$

PTS: 1 DIF: L4 REF: 7-3 Multiplying Powers With the Same Base

OBJ: 7-3.1 To multiply powers with the same base NAT: N.1.d| N.1.f| N.3.a| A.3.c| A.3.h

STA: L1.1.4| L2.1.2| A1.1.2

TOP: 7-3 Problem 2 Multiplying Powers in Algebraic Expressions

DOK: DOK 1

84. ANS:

$$m^{14}$$

PTS: 1 DIF: L4 REF: 7-4 More Multiplication Properties of Exponents

OBJ: 7-4.1 To raise a power to a power NAT: N.1.d| N.1.f| N.3.a| A.3.c| A.3.h

STA: L1.1.4| L2.1.2| A1.1.2

TOP: 7-4 Problem 1 Simplifying a Power Raised to a Power

DOK: DOK 1

85. ANS:

$$y^{60}$$

PTS: 1 DIF: L4 REF: 7-4 More Multiplication Properties of Exponents

OBJ: 7-4.1 To raise a power to a power NAT: N.1.d| N.1.f| N.3.a| A.3.c| A.3.h

STA: L1.1.4| L2.1.2| A1.1.2

TOP: 7-4 Problem 2 Simplifying an Expression With Powers

DOK: DOK 1

86. ANS:

$$81q^8$$

PTS: 1 DIF: L3 REF: 7-4 More Multiplication Properties of Exponents

OBJ: 7-4.2 To raise a product to a power

NAT: N.1.d| N.1.f| N.3.a| A.3.c| A.3.h STA: L1.1.4| L2.1.2| A1.1.2

TOP: 7-4 Problem 3 Simplifying a Product Raised to a Power

DOK: DOK 1

87. ANS:
0.02 and -0.02

PTS: 1 DIF: L4 REF: 6-1 Roots and Radical Expressions
OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
TOP: 6-1 Problem 1 Finding All Real Roots KEY: nth root
DOK: DOK 1

88. ANS:
0.03

PTS: 1 DIF: L4 REF: 6-1 Roots and Radical Expressions
OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
TOP: 6-1 Problem 1 Finding All Real Roots KEY: nth root
DOK: DOK 1

89. ANS:
1.3

PTS: 1 DIF: L3 REF: 6-1 Roots and Radical Expressions
OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
TOP: 6-1 Problem 2 Finding Roots KEY: radicand | index | nth root
DOK: DOK 1

90. ANS:
no real number root

PTS: 1 DIF: L3 REF: 6-1 Roots and Radical Expressions
OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
TOP: 6-1 Problem 2 Finding Roots KEY: radicand | index | nth root
DOK: DOK 1

91. ANS:
 $6|g^3|$

PTS: 1 DIF: L2 REF: 6-1 Roots and Radical Expressions
OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
TOP: 6-1 Problem 3 Simplifying Radical Expressions KEY: radicand | index | nth root
DOK: DOK 1

92. ANS:
 $3|x^5|y^2$

PTS: 1 DIF: L3 REF: 6-1 Roots and Radical Expressions
OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
TOP: 6-1 Problem 3 Simplifying Radical Expressions KEY: radicand | index | nth root
DOK: DOK 1

93. ANS:
 $3x^5y^8$

PTS: 1 DIF: L3 REF: 6-1 Roots and Radical Expressions
 OBJ: 6-1.1 To find nth roots NAT: A.3.e STA: A1.1.4
 TOP: 6-1 Problem 3 Simplifying Radical Expressions KEY: radicand | index | nth root
 DOK: DOK 1

94. ANS:
 $2\sqrt{3}$

PTS: 1 DIF: L2 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 1 Multiplying Radical Expressions
 DOK: DOK 1

95. ANS:
 $\sqrt[4]{33}$

PTS: 1 DIF: L2 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 1 Multiplying Radical Expressions
 DOK: DOK 1

96. ANS:
 $x\sqrt{7} - 49\sqrt{x}$

PTS: 1 DIF: L4 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 1 Multiplying Radical Expressions
 DOK: DOK 2

97. ANS:
 $4a^4b^2\sqrt[3]{2a}$

PTS: 1 DIF: L3 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 2 Simplifying a Radical Expression
 KEY: simplest form of a radical DOK: DOK 1

98. ANS:
 $3a^5b^3\sqrt[3]{4a}$

PTS: 1 DIF: L3 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 2 Simplifying a Radical Expression
 KEY: simplest form of a radical DOK: DOK 1

99. ANS:

$$x^3 \cdot \sqrt[3]{63x^2}$$

PTS: 1 DIF: L3 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 3 Simplifying a Product
 KEY: simplest form of a radical DOK: DOK 2

100. ANS:

$$10x^4y^5\sqrt{3y}$$

PTS: 1 DIF: L3 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 3 Simplifying a Product
 KEY: simplest form of a radical DOK: DOK 2

101. ANS:

$$3\sqrt[3]{3}$$

PTS: 1 DIF: L2 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 4 Dividing Radical Expressions
 KEY: simplest form of a radical DOK: DOK 1

102. ANS:

$$2\sqrt[4]{5}$$

PTS: 1 DIF: L2 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 4 Dividing Radical Expressions
 KEY: simplest form of a radical DOK: DOK 1

103. ANS:

$$3x^6\sqrt[3]{2x}$$

PTS: 1 DIF: L3 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 4 Dividing Radical Expressions
 KEY: simplest form of a radical DOK: DOK 1

104. ANS:

$$\frac{x^3y^2\sqrt{30y}}{5}$$

PTS: 1 DIF: L3 REF: 6-2 Multiplying and Dividing Radical Expressions
 OBJ: 6-2.1 To multiply and divide radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-2 Problem 5 Rationalizing the Denominator
 KEY: rationalizing the denominator DOK: DOK 1

105. ANS:

$$8\sqrt[4]{2x}$$

PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 1 Adding and Subtracting Radical Expressions
 KEY: like radicals DOK: DOK 1

106. ANS:

not possible to simplify

PTS: 1 DIF: L3 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 1 Adding and Subtracting Radical Expressions
 KEY: like radicals DOK: DOK 1

107. ANS:

$$-3\sqrt{2a}$$

PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 1 Adding and Subtracting Radical Expressions
 KEY: like radicals DOK: DOK 1

108. ANS: A

PTS: 1 DIF: L3 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 3 Simplifying Before Adding or Subtracting
 DOK: DOK 2

109. ANS: A

PTS: 1 DIF: L4 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 3 Simplifying Before Adding or Subtracting
 DOK: DOK 2

110. ANS:

$$54 - \sqrt{2}$$

PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 4 Multiplying Binomial Radical Expressions
 DOK: DOK 1

111. ANS:

$$28 + 10\sqrt{3}$$

PTS: 1 DIF: L3 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 4 Multiplying Binomial Radical Expressions
 DOK: DOK 2

112. ANS:

$$-3 + 2\sqrt{2}$$

PTS: 1 DIF: L3 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 6 Rationalizing the Denominator
 DOK: DOK 1

113. ANS:

$$\frac{2^3\sqrt{36} + 3^3\sqrt{4}}{6}$$

PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
 OBJ: 6-3.1 To add and subtract radical expressions NAT: N.5.e| A.3.c| A.3.e
 STA: A1.1.4 TOP: 6-3 Problem 6 Rationalizing the Denominator
 DOK: DOK 1

114. ANS:

20

PTS: 1 DIF: L3 REF: 6-4 Rational Exponents
 OBJ: 6-4.1 To simplify expressions with rational exponents
 TOP: 6-4 Problem 1 Simplifying Expressions with Rational Exponents
 KEY: rational exponents DOK: DOK 1

115. ANS:

3

PTS: 1 DIF: L3 REF: 6-4 Rational Exponents
 OBJ: 6-4.1 To simplify expressions with rational exponents
 TOP: 6-4 Problem 1 Simplifying Expressions with Rational Exponents
 KEY: rational exponents DOK: DOK 1

116. ANS: B PTS: 1 DIF: L2 REF: 6-4 Rational Exponents

OBJ: 6-4.1 To simplify expressions with rational exponents
 TOP: 6-4 Problem 1 Simplifying Expressions with Rational Exponents
 KEY: rational exponents DOK: DOK 1

117. ANS:

$$3^8\sqrt{x^3}$$

PTS: 1 DIF: L2 REF: 6-4 Rational Exponents
 OBJ: 6-4.1 To simplify expressions with rational exponents
 TOP: 6-4 Problem 2 Converting Between Exponential and Radical Form
 KEY: rational exponents DOK: DOK 1

118. ANS:

$$8x^{-\frac{15}{7}}$$

PTS: 1 DIF: L4 REF: 6-4 Rational Exponents

OBJ: 6-4.1 To simplify expressions with rational exponents

TOP: 6-4 Problem 2 Converting Between Exponential and Radical Form

KEY: rational exponents DOK: DOK 1

119. ANS: A PTS: 1 DIF: L3 REF: 6-4 Rational Exponents

OBJ: 6-4.1 To simplify expressions with rational exponents

TOP: 6-4 Problem 4 Combining Radical Expressions KEY: rational exponent

DOK: DOK 1

120. ANS: B PTS: 1 DIF: L3 REF: 6-4 Rational Exponents

OBJ: 6-4.1 To simplify expressions with rational exponents

TOP: 6-4 Problem 4 Combining Radical Expressions KEY: rational exponent

DOK: DOK 1

121. ANS: A PTS: 1 DIF: L3 REF: 6-4 Rational Exponents

OBJ: 6-4.1 To simplify expressions with rational exponents

TOP: 6-4 Problem 5 Simplifying Numbers With Rational Exponents

KEY: rational exponent DOK: DOK 1

122. ANS:

-6

PTS: 1 DIF: L2 REF: 6-5 Solving Square Root and Other Radical Equations

OBJ: 6-5.1 To solve square root and other radical equations NAT: A.2.a

TOP: 6-5 Problem 1 Solving a Square Root Equation KEY: square root equation

DOK: DOK 2

123. ANS:

28

PTS: 1 DIF: L2 REF: 6-5 Solving Square Root and Other Radical Equations

OBJ: 6-5.1 To solve square root and other radical equations NAT: A.2.a

TOP: 6-5 Problem 1 Solving a Square Root Equation KEY: square root equation

DOK: DOK 2

124. ANS:

26

PTS: 1 DIF: L3 REF: 6-5 Solving Square Root and Other Radical Equations

OBJ: 6-5.1 To solve square root and other radical equations NAT: A.2.a

TOP: 6-5 Problem 2 Solving Other Radical Equations KEY: radical equation

DOK: DOK 2

125. ANS:

-4

PTS: 1 DIF: L3 REF: 6-5 Solving Square Root and Other Radical Equations

OBJ: 6-5.1 To solve square root and other radical equations NAT: A.2.a

TOP: 6-5 Problem 4 Checking for Extraneous Solutions KEY: radical equation

DOK: DOK 2

126. ANS:
-53

PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.2 To find the composite of two functions NAT: A.3.f
STA: A2.2.1 TOP: 6-6 Problem 3 Composing Functions
KEY: composite function DOK: DOK 2

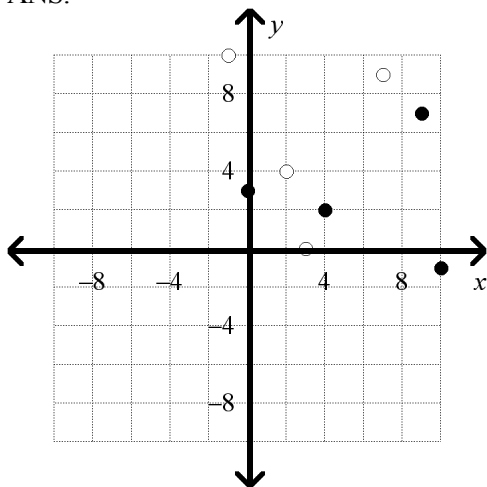
127. ANS:
 $\frac{63}{55}$

PTS: 1 DIF: L4 REF: 6-6 Function Operations
OBJ: 6-6.2 To find the composite of two functions NAT: A.3.f
STA: A2.2.1 TOP: 6-6 Problem 3 Composing Functions
KEY: composite function DOK: DOK 2

128. ANS:
9

PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.2 To find the composite of two functions NAT: A.3.f
STA: A2.2.1 TOP: 6-6 Problem 3 Composing Functions
KEY: composite function DOK: DOK 2

129. ANS:



PTS: 1 DIF: L2 REF: 6-7 Inverse Relations and Functions
OBJ: 6-7.1 To find the inverse of a relation or function NAT: A.1.j
STA: A2.2.3 TOP: 6-7 Problem 1 Finding the Inverse of a relation
KEY: inverse relation DOK: DOK 1

130. ANS:

Relation t is a function. The inverse of relation t is not a function.

PTS: 1 DIF: L2 REF: 6-7 Inverse Relations and Functions

OBJ: 6-7.1 To find the inverse of a relation or function NAT: A.1.j

STA: A2.2.3 TOP: 6-7 Problem 1 Finding the Inverse of a relation

KEY: inverse relation DOK: DOK 1

131. ANS:

$$y = \pm \sqrt{\frac{x+3}{7}}$$

PTS: 1 DIF: L3 REF: 6-7 Inverse Relations and Functions

OBJ: 6-7.1 To find the inverse of a relation or function NAT: A.1.j

STA: A2.2.3 TOP: 6-7 Problem 2 Finding an Equation for the Inverse

KEY: inverse relation DOK: DOK 2

132. ANS:

$$y = \frac{1}{3}x - 3$$

PTS: 1 DIF: L3 REF: 6-7 Inverse Relations and Functions

OBJ: 6-7.1 To find the inverse of a relation or function NAT: A.1.j

STA: A2.2.3 TOP: 6-7 Problem 2 Finding an Equation for the Inverse

KEY: inverse relation DOK: DOK 2

133. ANS:

$$f^{-1}(x) = \frac{8 \pm \sqrt{x}}{2}; f^{-1} \text{ is not a function.}$$

PTS: 1 DIF: L3 REF: 6-7 Inverse Relations and Functions

OBJ: 6-7.1 To find the inverse of a relation or function NAT: A.1.j

STA: A2.2.3 TOP: 6-7 Problem 4 Finding an Inverse Function

KEY: inverse function DOK: DOK 2

134. ANS:

$$f^{-1}(x) = x^2 + 5; y \geq 5$$

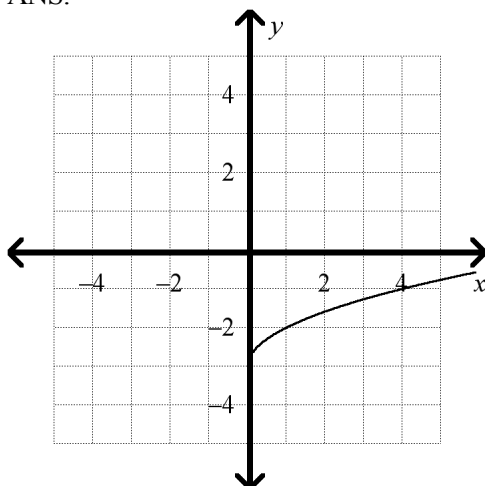
PTS: 1 DIF: L2 REF: 6-7 Inverse Relations and Functions

OBJ: 6-7.1 To find the inverse of a relation or function NAT: A.1.j

STA: A2.2.3 TOP: 6-7 Problem 4 Finding an Inverse Function

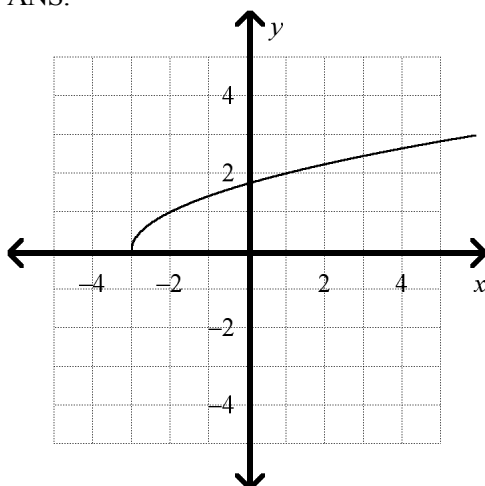
KEY: inverse function DOK: DOK 2

135. ANS:



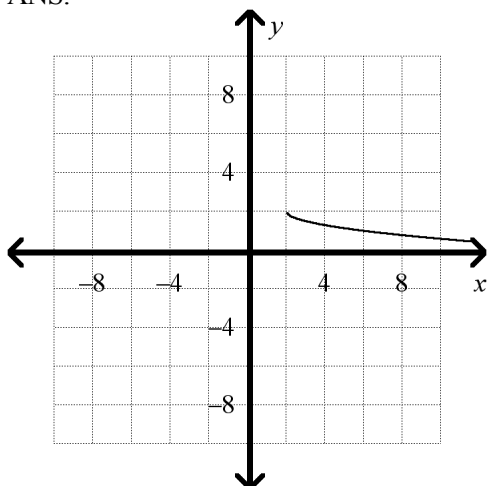
PTS: 1 DIF: L2 REF: 6-8 Graphing Radical Functions
 OBJ: 6-8.1 To graph square root and other radical functions NAT: G.2.c
 STA: A2.2.2 TOP: 6-8 Problem 1 Translating a Square Root Function Vertically
 KEY: square root function DOK: DOK 2

136. ANS:



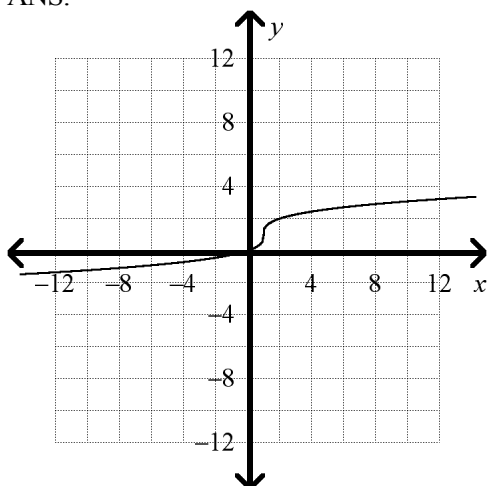
PTS: 1 DIF: L2 REF: 6-8 Graphing Radical Functions
 OBJ: 6-8.1 To graph square root and other radical functions NAT: G.2.c
 STA: A2.2.2 TOP: 6-8 Problem 2 Translating a Square Root Function Horizontally
 KEY: square root function DOK: DOK 2

137. ANS:



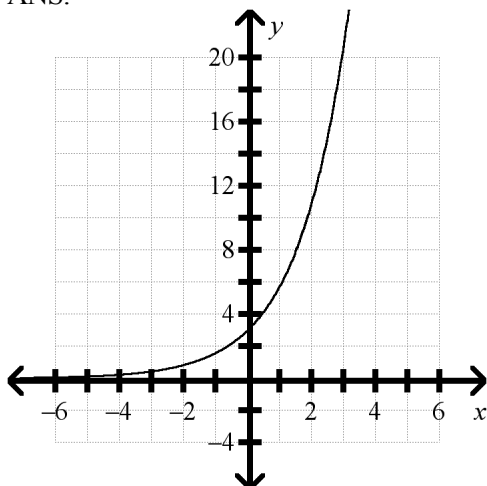
PTS: 1 DIF: L4 REF: 6-8 Graphing Radical Functions
 OBJ: 6-8.1 To graph square root and other radical functions NAT: G.2.c
 STA: A2.2.2 TOP: 6-8 Problem 3 Graphing a square root function
 KEY: square root function DOK: DOK 2

138. ANS:



PTS: 1 DIF: L3 REF: 6-8 Graphing Radical Functions
 OBJ: 6-8.1 To graph square root and other radical functions NAT: G.2.c
 STA: A2.2.2 TOP: 6-8 Problem 5 Graphing a Cube Root Function
 KEY: radical function DOK: DOK 2

139. ANS:



PTS: 1 DIF: L4 REF: 7-1 Exploring Exponential Models
 OBJ: 7-1.1 To model exponential growth and decay NAT: A.1.b| A.2.f| A.2.g
 TOP: 7-1 Problem 1 Graphing an Exponential Function KEY: exponential function
 DOK: DOK 2

140. ANS:

130% increase

PTS: 1 DIF: L3 REF: 7-1 Exploring Exponential Models
 OBJ: 7-1.1 To model exponential growth and decay NAT: A.1.b| A.2.f| A.2.g
 TOP: 7-1 Problem 2 Identifying Exponential Growth and Decay
 KEY: exponential decay | exponential function | exponential growth
 DOK: DOK 2

141. ANS:

$$f(x) = 820(1.23)^x; 1526$$

PTS: 1 DIF: L3 REF: 7-1 Exploring Exponential Models
 OBJ: 7-1.1 To model exponential growth and decay NAT: A.1.b| A.2.f| A.2.g
 TOP: 7-1 Problem 3 Modeling Exponential Growth
 KEY: exponential growth | exponential function DOK: DOK 3

142. ANS:

$$y = 361 \left(\frac{1}{2} \right)^{\frac{1}{32}x}; 323.945 \text{ kg}$$

PTS: 1 DIF: L3 REF: 7-2 Properties of Exponential Functions
 OBJ: 7-2.1 To explore the properties of functions of the form $y = ab^x$
 NAT: N.3.f| G.2.c| A.1.b| A.2.d| A.2.h STA: L2.2.3| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-2 Problem 3 Using an Exponential Model KEY: exponential function
 DOK: DOK 3

143. ANS:

$$y = 722 \left(\frac{1}{2} \right)^{\frac{1}{71}x}; 611.589 \text{ kg}$$

PTS: 1 DIF: L3 REF: 7-2 Properties of Exponential Functions
 OBJ: 7-2.1 To explore the properties of functions of the form $y = ab^x$
 NAT: N.3.f| G.2.c| A.1.b| A.2.d| A.2.h STA: L2.2.3| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-2 Problem 3 Using an Exponential Model KEY: exponential function
 DOK: DOK 3

144. ANS:

\$5,101.04

PTS: 1 DIF: L2 REF: 7-7 Exponential Growth and Decay
 OBJ: 7-7.1 To model exponential growth and decay NAT: A.2.g| A.3.h| A.4.c
 STA: A3.2.4| A3.2.5 TOP: 7-7 Problem 3 Modeling Exponential Decay
 KEY: exponential decay | decay factor DOK: DOK 1

145. ANS:

\$15,494.70

PTS: 1 DIF: L3 REF: 7-7 Exponential Growth and Decay
 OBJ: 7-7.1 To model exponential growth and decay NAT: A.2.g| A.3.h| A.4.c
 STA: A3.2.4| A3.2.5 TOP: 7-7 Problem 2 Compound Interest
 KEY: exponential growth | growth factor | compound interest
 DOK: DOK 1

146. ANS:

\$1,543.60

PTS: 1 DIF: L3 REF: 7-7 Exponential Growth and Decay
 OBJ: 7-7.1 To model exponential growth and decay NAT: A.2.g| A.3.h| A.4.c
 STA: A3.2.4| A3.2.5 TOP: 7-7 Problem 2 Compound Interest
 KEY: exponential growth | growth factor | compound interest
 DOK: DOK 1

147. ANS:

\$1,923.23

PTS: 1 DIF: L2 REF: 7-2 Properties of Exponential Functions
 OBJ: 7-2.2 To graph exponential functions that have base e NAT: N.3.f| G.2.c| A.1.b| A.2.d| A.2.h
 STA: L2.2.3| A2.2.2| A3.2.2| A3.2.3 TOP: 7-2 Problem 5 Continuously Compounded Interest
 KEY: continuously compounded interest DOK: DOK 2

148. ANS:

\$705.78

PTS: 1 DIF: L3 REF: 7-2 Properties of Exponential Functions
 OBJ: 7-2.2 To graph exponential functions that have base e NAT: N.3.f| G.2.c| A.1.b| A.2.d| A.2.h
 STA: L2.2.3| A2.2.2| A3.2.2| A3.2.3 TOP: 7-2 Problem 5 Continuously Compounded Interest
 KEY: continuously compounded interest DOK: DOK 2

149. ANS:
 $\log_2 32 = 5$

PTS: 1 DIF: L2 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.1 To write and evaluate logarithmic expressions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 1 Writing Exponential Equations in Logarithmic Form
 KEY: logarithm DOK: DOK 2

150. ANS:
 $\log_{125} 625 = \frac{4}{3}$

PTS: 1 DIF: L3 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.1 To write and evaluate logarithmic expressions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 1 Writing Exponential Equations in Logarithmic Form
 KEY: logarithm DOK: DOK 2

151. ANS:
 -4

PTS: 1 DIF: L3 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.1 To write and evaluate logarithmic expressions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 2 Evaluating a Logarithm KEY: logarithm
 DOK: DOK 2

152. ANS:
 5

PTS: 1 DIF: L2 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.1 To write and evaluate logarithmic expressions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 2 Evaluating a Logarithm KEY: logarithm
 DOK: DOK 2

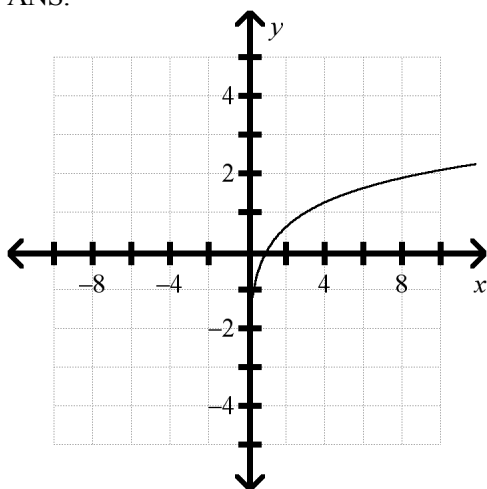
153. ANS:
 -2

PTS: 1 DIF: L4 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.1 To write and evaluate logarithmic expressions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 2 Evaluating a Logarithm KEY: logarithm
 DOK: DOK 2

154. ANS:
2.2

PTS: 1 DIF: L4 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.1 To write and evaluate logarithmic expressions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 3 Using a Logarithmic Scale KEY: logarithm | problem solving
 DOK: DOK 2

155. ANS:



PTS: 1 DIF: L2 REF: 7-3 Logarithmic Functions as Inverses
 OBJ: 7-3.2 To graph logarithmic functions NAT: G.2.c| A.2.h| A.3.h
 STA: L2.3.2| A1.1.6| A2.2.2| A3.2.2| A3.2.3
 TOP: 7-3 Problem 4 Graphing a Logarithmic Function KEY: logarithmic function
 DOK: DOK 2

156. ANS:
 $\log_b(q^3v^6)$

PTS: 1 DIF: L3 REF: 7-4 Properties of Logarithms
 OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
 STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 1 Simplifying Logarithms
 DOK: DOK 2

157. ANS:
 $\log_3 2$

PTS: 1 DIF: L2 REF: 7-4 Properties of Logarithms
 OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
 STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 1 Simplifying Logarithms
 DOK: DOK 2

158. ANS:
none of these

PTS: 1 DIF: L4 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 1 Simplifying Logarithms
DOK: DOK 2

159. ANS:
 $\log_3 d - \log_3 12$

PTS: 1 DIF: L2 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 2 Expanding Logarithms
DOK: DOK 2

160. ANS:
 $\log_3 11 + 3 \log_3 p$

PTS: 1 DIF: L3 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 2 Expanding Logarithms
DOK: DOK 2

161. ANS:
 $\frac{1}{2} \log_b 57 - \frac{1}{2} \log_b 74$

PTS: 1 DIF: L4 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 2 Expanding Logarithms
DOK: DOK 2

162. ANS:
2.161

PTS: 1 DIF: L2 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 3 Using the Change of Base Formula
KEY: Change of Base Formula DOK: DOK 2

163. ANS:
1.712

PTS: 1 DIF: L3 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 3 Using the Change of Base Formula
KEY: Change of Base Formula DOK: DOK 2

164. ANS: B PTS: 1 DIF: L2 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 3 Using the Change of Base Formula
KEY: Change of Base Formula DOK: DOK 2

165. ANS:
106.9 decibels
- PTS: 1 DIF: L3 REF: 7-4 Properties of Logarithms
OBJ: 7-4.1 To use the properties of logarithms NAT: N.1.d| A.3.h
STA: L2.1.3| L2.3.2 TOP: 7-4 Problem 4 Using a Logarithmic Scale
DOK: DOK 2
166. ANS: B PTS: 1 DIF: L2 REF: 1-2 Properties of Real Numbers
OBJ: 1-2.1 To graph and order real numbers NAT: N.1.i| N.5.f
STA: L1.2.1 TOP: 1-2 Problem 1 Classifying a Variable
DOK: DOK 1
167. ANS: C PTS: 1 DIF: L2 REF: 1-2 Properties of Real Numbers
OBJ: 1-2.1 To graph and order real numbers NAT: N.1.i| N.5.f
STA: L1.2.1 TOP: 1-2 Problem 1 Classifying a Variable
DOK: DOK 1
168. ANS: B PTS: 1 DIF: L2 REF: 1-2 Properties of Real Numbers
OBJ: 1-2.1 To graph and order real numbers NAT: N.1.i| N.5.f
STA: L1.2.1 TOP: 1-2 Problem 1 Classifying a Variable
169. ANS: D PTS: 1 DIF: L2 REF: 1-3 Algebraic Expressions
OBJ: 1-3.1 To evaluate algebraic expressions NAT: N.1.d| N.3.a| N.3.b| A.3.b| A.3.d
STA: L1.2.1| A1.1.1
TOP: 1-3 Problem 1 Modeling Words With an Algebraic Expression
DOK: DOK 1
170. ANS: B PTS: 1 DIF: L3 REF: 1-3 Algebraic Expressions
OBJ: 1-3.1 To evaluate algebraic expressions NAT: N.1.d| N.3.a| N.3.b| A.3.b| A.3.d
STA: L1.2.1| A1.1.1
TOP: 1-3 Problem 1 Modeling Words With an Algebraic Expression
DOK: DOK 1
171. ANS: A PTS: 1 DIF: L2 REF: 1-3 Algebraic Expressions
OBJ: 1-3.1 To evaluate algebraic expressions NAT: N.1.d| N.3.a| N.3.b| A.3.b| A.3.d
STA: L1.2.1| A1.1.1 TOP: 1-3 Problem 3 Evaluating Algebraic Expressions
KEY: evaluate DOK: DOK 1
172. ANS: D PTS: 1 DIF: L4 REF: 1-3 Algebraic Expressions
OBJ: 1-3.1 To evaluate algebraic expressions NAT: N.1.d| N.3.a| N.3.b| A.3.b| A.3.d
STA: L1.2.1| A1.1.1 TOP: 1-3 Problem 3 Evaluating Algebraic Expressions
KEY: evaluate DOK: DOK 1
173. ANS: D PTS: 1 DIF: L2 REF: 1-4 Solving Equations
OBJ: 1-4.1 To solve equations NAT: A.2.a| A.4.c STA: L1.2.1| A1.2.8| A1.2.9
TOP: 1-4 Problem 2 Solving a Multi-Step Equation
KEY: equation | solution of an equation | inverse operations DOK: DOK 1
174. ANS: B PTS: 1 DIF: L2 REF: 1-4 Solving Equations
OBJ: 1-4.1 To solve equations NAT: A.2.a| A.4.c STA: L1.2.1| A1.2.8| A1.2.9
TOP: 1-4 Problem 2 Solving a Multi-Step Equation
KEY: equation | solution of an equation | inverse operations DOK: DOK 1