Chapter 6 Review Exercises

Fill in each blank with word that correctly completes the sentence.

1. 3^5 is called the exponential form, and $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$ is called the _____ form. **(6.1)**

2. The negative in the exponent of x^{-n} means the _____ of x^n. **(6.2)**

3. In scientific notation, the number multiplied by the power of 10 is called the _____ . **(6.3)**

4. In the algebraic expression $4x^2 - 6x + 3$, 3 is called the _____. **(6.4)**

5. The number of variable factors in a term is called the _____ of the term. **(6.4)**

6. The first term of a polynomial in descending order is called the _____ _____ of the polynomial. **(6.4)**

7. The initial product of a binomial and a trinomial has _____ (how many) terms. **(6.6)**

8. Two binomials with the same first term but opposite second terms, such as $(2x + 5)$ and $(2x - 5)$, are a pair of _____ . **(6.7)**

Section 6.1

Evaluate.

9. 4^3

10. $(-2)^4$

11. $(-3)^1$

12. $(-8)^0$

Simplify each.

13. $v^3 \cdot v^6$

14. $k^5 \cdot k^0$

15. $x \cdot x^4$

16. $y^3 \cdot y^4 \cdot y^2$

17. $\dfrac{w^8}{w^2}$

18. $\dfrac{k^9}{k^3}$

19. $\dfrac{y^8}{y}$

20. $\dfrac{w^5}{w^0}$

Use the Distributive Properties for Exponents to rewrite each of these. Simplify if possible.

21. $(ab)^5$

22. $(-7r)^0$

23. $\left(\dfrac{h}{k}\right)^6$

24. $\left(\dfrac{-9x}{2y}\right)^2$

Use the Power Rule to rewrite each of these. Simplify if possible.

25. $(y^5)^2$

26. $(2w^4v^2)^3$

27. $\left(\dfrac{x}{y^4}\right)^6$

28. $\left(\dfrac{-7}{y^5}\right)^2$

Section 6.2

Write each expression with a positive exponent. Evaluate wherever possible.

29. 10^{-4} **30.** p^{-7} **31.** $\left(\frac{8}{9}\right)^{-2}$ **32.** $\left(\frac{2x}{y}\right)^{-3}$

Simplify each expression. Write each result with positive exponents only.

33. $x^{-2} \cdot x^8$ **34.** $y^{-4} \cdot y^3$ **35.** $x^{-3} \cdot x^{-1}$ **36.** $\frac{r^4}{r^{-1}}$

37. $\frac{y^{-9}}{y^{-6}}$ **38.** $\frac{x^{-2}}{x^6}$ **39.** $\left(m^{-2}\right)^5$ **40.** $\left(p^{-3}\right)^{-1}$

Section 6.3

Write each number in scientific notation.

41. 53,000 **42.** 20,900,000 **43.** 0.00038 **44.** 0.00000406

Expand each number to its natural form.

45. 8.27×10^3 **46.** 2.305×10^5 **47.** 9.26×10^{-6} **48.** 1.014×10^{-3}

Perform the indicated operation. Write each answer in scientific notation.

49. $(3.9 \times 10^5) \times (2.0 \times 10^6)$ **50.** $(6.4 \times 10^{-7}) \times (4.5 \times 10^3)$

51. $\frac{6.4 \times 10^7}{3.2 \times 10^2}$ **52.** $\frac{1.1 \times 10^{-9}}{4.4 \times 10^{-6}}$

Section 6.4

Evaluate each polynomial with the given replacement value.

53. $x^2 - 4x - 1, \ x = 3$ **54.** $2m^3 + 3m^2 - m, \ m = -1$

Indicate the degree of each term.

55. $-c^5$ **56.** $6w$ **57.** $-2x^3y^4$ **58.** $-7mp$

Simplify each polynomial by combining like terms, if possible. Write all answers in descending order.

59. $7w^3 - 15w^3$ **60.** $9p^7 - p^2 - 3p^2$

61. $2x - x^3 + 3x - 6x^3$ **62.** $-3c^2 + c^2 + 2c + 7c^2 - 3c$

Kyle threw a rock upward over the ocean from a 400-foot cliff. The rock's height above the ground, in feet, at the t-second mark is given by $h = 400 + 50t - 16t^2$. *Write a sentence answering each question.*

63. How high above the ocean was the rock at the 1-second mark?

64. How high above the ocean was the rock at the 2-second mark?

Section 6.5

Distribute. Write each answer in descending order.

65. $-1(-5v + 4v^2 - 1)$ **66.** $-1(3n^2 - 9n - 7n^3)$

Perform the indicated operations. Simplify and write each answer in descending order.

67. $(3m - 9) + (4m + 2)$ **68.** $(x^2 + x - 3) + (-x + 5x^2 - 2)$

69. $(4 - 5v) - (v + 5)$ **70.** $(6y + 9y^2 - 3) - (9 - 5y - 2y^2)$

Section 6.6

Multiply.

71. $(9n^2)(3n^3)$ **72.** $(2x^3)(-x)$ **73.** $(8a^4)^2$ **74.** $(-3x^8)^2$

Multiply. Write each answer in descending order.

75. $4n(3n^3 + 7)$ **76.** $-c^2(c^3 - 7c)$

77. $2m^2(4m^2 + m^3 + 8)$ **78.** $-x^2(-x^2 - x + 10)$

Multiply and simplify. Write each answer in descending order.

79. $(2m - 5)(3m - 9)$ **80.** $(4 - 5x)(2x - 3)$

81. $(x^2 - 2x + 4)(x + 2)$ **82.** $(5m^2 - m + 1)(m^2 - 3m - 4)$

Section 6.7

Multiply. Write each answer in descending order and combine like terms.

83. $(m + 5)(m + 3)$ **84.** $(x + 5)(x - 6)$

85. $(4w - 2)(4w + 1)$ **86.** $(3x + 2)(x + 5)$

87. $(x + 1)(x - 1)$ **88.** $(4x - 9)(4x + 9)$

89. $(w^3 - 5)(w^3 + 5)$ **90.** $(2x^2 - 1)(5x^2 - 4)$

91. $(m + 6)^2$

92. $(w - 7)^2$

93. $(3c + 4)^2$

94. $(2w^3 - 1)^2$

The result of multiplying a pair of conjugates is shown. Fill in each set of parentheses with an appropriate binomial.

95. ( )( ) $= x^2 - 64$

96. ( )( ) $= m^2 - 121$

97. ( )( ) $= 16m^2 - 9$

98. ( )( ) $= 25u^2 - v^2$

Section 6.8

Simplify each fraction.

99. $\dfrac{28q^6}{4q^2}$

100. $\dfrac{24v^7}{-8v}$

101. $\dfrac{28w^8}{-7w^6}$

102. $\dfrac{-14y^6}{-7y^6}$

Divide using distribution.

103. $\dfrac{24w^8 - 3w^7}{3w^6}$

104. $\dfrac{14y^5 - 21y^3 + 7y^2}{-7y^2}$

105. $\dfrac{15y^5 - 10y^4 + 5y^3}{5y^3}$

106. $\dfrac{9x^8y^6 - 18x^6y + 36x^2y^2}{9x^2y}$

Divide each using long division.

107. $\dfrac{y^2 + 5y - 14}{y - 2}$

109. $(x^3 + 3x^2 - 12x - 7) \div (x + 5)$

109. $(4x^3 - 26x^2 + 15x - 20) \div (x - 6)$

110. $(8y^3 + 14y^2 + 5y + 3) \div (2y + 3)$

111. $(8w - 5 + 6w^2) \div (w + 2)$

112. $(4 - 6x^2 + x^3 + 12x) \div (x - 1)$

113. $(2y^3 - 9y^2 + 9) \div (y - 4)$

114. $(w^3 - 8) \div (w - 2)$