Name _____ Class _____ Date _____

Extra Practice

Chapter 7

Lessons 7-1 to 7-5

Simplify each expression. Use only positive exponents.

1. $(2t)^{-6}$

2. $5m^5m^{-8}$

3. $(4.5)^4(4.5)^{-2}$

4. $(m^7t^{-5})^2$

5. $(x^2n^4)(n^{-8})$

6. $(w^{-2}j^{-4})^{-3}(j^7j^3)$

7. $(t^{6})^3(m)^2$

8. $(3n^4)^2$

9. $\dfrac{r^5}{g^{-3}}$

10. $\dfrac{1}{a^{-4}}$

11. $\dfrac{w^7}{w^{-6}}$

12. $\dfrac{6}{t^{-4}}$

13. $\dfrac{a^2b^{-7}c^4}{a^5b^3c^{-2}}$

14. $\dfrac{(2t^5)^3}{4t^8t^{-1}}$

15. $\left(\dfrac{a^6}{a^7}\right)^{-3}$

16. $\left(\dfrac{c^5c^{-3}}{c^{-4}}\right)^{-2}$

17. $\left(\dfrac{4x^3}{8x^{-2}}\right)^{0}$

18. $\left(\dfrac{y^{-3}}{y^3}\right)^{2}$

Evaluate each expression for $m = 2$, $t = -3$, $w = 4$, and $z = 0$.

19. t^m

20. t^{-m}

21. $(w \cdot t)^m$

22. $w^m \cdot t^m$

23. $(w^z)^m$

24. w^mw^z

25. $z^{-t}(m^t)^z$

26. $w^{-t}t^t$

27. $\left(\dfrac{t^w}{m^t}\right)^z$

Write each number in scientific notation.

28. 34,000,000

29. 0.00063

30. 1500

31. 0.0002

32. 360,000

33. 6,200,000,000

34. 0.05

35. 0.000000000891

36. 75,000,000,000

Extra Practice (continued)

Chapter 7

Write each number in standard notation.

37. 8.05×10^{6}

38. 3.2×10^{-7}

39. 9.0×10^{8}

40. 4.25×10^{-4}

41. 2.35×10^{2}

42. 6.3×10^{4}

43. 2.001×10^{-5}

44. 5.2956×10^{3}

45. 8.345×10^{-3}

46. Suppose an investment doubles in value every 5 years. This year the investment is worth $12,480. How much will it be worth 10 years from now? How much was it worth 5 years ago?

Write each number in scientific notation.

47. A bacteria culture has a population of approximately 7,500,000,000.

48. The diameter of a blood cell is about 0.0000082 m.

Write each answer in scientific notation.

49. A light-year is the distance light travels in one year. If the speed of light is about 3×10^{5} km/s, how long is a light-year in kilometers? (Use 365 days for the length of a year).

50. The radius of Earth is approximately 6.4×10^{6} m. Use the formula $V = \frac{4}{3}\pi r^{3}$ to find the volume of Earth.

51. A spherical cell has a radius of 2.75×10^{-6} m. Use the formula for the surface area of a sphere $S.A. = 4\pi r^{2}$ to find the surface area of a cell.

Extra Practice (continued)

Chapter 7

52. What is the volume of a cube with a side length of $\frac{4}{5}$ m?

53. The speed of sound is approximately 1.2×10^3 km/h. How long does it take for sound to travel 7.2×10^2 km? Write your answer in minutes.

Lesson 7-6

Evaluate each function over the domain {–1, 0, 1, 2}. As the values of the domain increase, do the values of the function *increase* or *decrease*?

54. $y = 3^x$

55. $y = \left(\frac{3}{4}\right)^x$

56. $y = 1.5^x$

57. $y = \left(\frac{1}{2}\right) \cdot 3^x$

58. $y = -3 \cdot 7^x$

59. $y = -(4)^x$

60. $y = 3 \cdot \left(\frac{1}{5}\right)^x$

61. $y = 2^x$

62. $y = 2 \cdot 3^x$

63. $y = (0.8)^x$

64. $y = 2.5^x$

65. $y = -4 \cdot (0.2)^x$

Write and solve an exponential equation to answer each question.

66. Suppose an investment of $5,000 doubles every 12 years. How much is the investment worth after 36 years? After 48 years?

67. Suppose 15 animals are taken to an island, and then their population triples every 8 months. How many animals will there be in 4 years?

68. The population of a city this year is 34,500. The population is expected to grow by 3% each year. What will be the population of the city in 12 years?

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Extra Practice (continued)

Chapter 7

Lesson 7-7

Identify each function as *exponential growth* or *exponential decay*. Then identify the growth factor or decay factor.

69. $y = 8^x$

70. $y = \frac{3}{4} \cdot 2^x$

71. $y = 9 \cdot \left(\frac{1}{2}\right)^x$

72. $y = 4 \cdot 9^x$

73. $y = 0.65^x$

74. $y = 3 \cdot 1.5^x$

75. $y = \frac{2}{5} \cdot \left(\frac{1}{4}\right)^x$

76. $y = 0.1 \cdot 0.9^x$

77. $y = 0.7 \cdot 3.3^x$

Write an exponential function to model each situation. Find each amount after the specified time.

78. $200 principal, 4% compounded annually for 5 years

79. $1000 principal, 3.6% compounded monthly for 10 years

80. $3000 investment, 8% loss each year for 3 years

Find the balance in each account.

81. You deposit $2500 in a savings account with 3% interest compounded annually. What is the balance in the account after 6 years?

82. You deposit $750 in an account with 7% interest compounded semiannually. What is the balance in the account after 4 years?

83. You deposit $520 in an account with 4% interest compounded monthly. What is the balance in the account after 5 years?