

Chapter 8 Answers

Practice 8-1

1. 1 2. $\frac{1}{16}$ 3. $\frac{1}{27}$ 4. $\frac{1}{4096}$ 5. 32 6. 256 7. 18 8. 16
9. 3 10. 4 11. $\frac{1}{12}$ 12. $-\frac{1}{49}$ 13. 16 14. 1 15. $\frac{1}{4}$
16. 18 17. $\frac{1}{64}$ 18. 1 19. 5 20. 1 21. $\frac{1}{81}$ 22. 1
23. $-\frac{2}{27}$ 24. $\frac{4}{49}$ 25. $\frac{1}{36}$ 26. $-\frac{1}{8}$ 27. $\frac{1}{16}$ 28. $-\frac{1}{216}$
29. $-\frac{1}{2}$ 30. $\frac{1}{18}$ 31. $\frac{1}{36}$ 32. $\frac{1}{36}$ 33. $-\frac{1}{36}$ 34. $-\frac{1}{216}$
35. $\frac{1}{216}$ 36. $\frac{1}{1296}$ 37. $\frac{1}{x^8}$ 38. $\frac{x}{y^3}$ 39. $\frac{b}{a^5}$ 40. $\frac{m^2}{n^9}$
41. x^7 42. $3a^4$ 43. $5d^3$ 44. $6r^5s$ 45. $\frac{3}{x^6y^5}$ 46. $\frac{8b^2}{a^3c^2}$
47. $\frac{15}{s^9t}$ 48. $-\frac{7r^2}{p^5q^3}$ 49. $\frac{e^7}{d^4}$ 50. $\frac{3n^8}{m^4}$ 51. $\frac{6np}{m^8}$ 52. $\frac{d^3}{a^2bc}$
53. 10^{-4} 54. 10^{-6} 55. 10^{-7} 56. 10^{-9} 57. 0.00001
58. 0.00000001 59. 0.4 60. 0.0006 61. $\frac{1}{16}$ 62. 625
63. $\frac{1}{4}$ 64. $\frac{1}{25}$ 65. $\frac{5}{16}$ 66. $\frac{1}{1024}$ 67. $-\frac{1}{32}$ 68. $\frac{4}{25}$
69. $\frac{1}{16}$ 70. 100 71. 625 72. $-\frac{1}{625}$

Practice 8-2

1. 70,000 2. 0.03 3. 260,000 4. 0.00071 5. 0.0000571
6. 41,550,000 7. 301.07 8. 0.00009407 9. 31,300,000
10. 0.00837 11. 0.0018 12. 1600 13. 0.0080023
14. 690,200,000 15. 100,500 16. 0.0095 17. 5.1×10^7
18. 9.75×10^{11} 19. 1.2×10^{-7} 20. 5.008×10^{-6}
21. 1.56×10^{12} 22. 5×10^5 23. 2×10^{-3}
24. 1.095×10^{-3} 25. 1.94×10^5 26. 1.54×10^{-1}
27. 5×10^4 28. 3.1×10^{-6} 29. 7.9×10^5
30. 2.5×10^{-1} 31. 1.59×10^{-10} 32. 5.0009×10^{12}
33. 4×10^{-10} , 6×10^{-8} , 7×10^{-7} , 5×10^{-6}
34. 5.01×10^{-4} , 4.8×10^{-3} , 5.2×10^{-2} , 5.6×10^{-2}
35. 6.34×10^{-1} , 6.2×10^2 , 6.207×10^3 , 62,040
36. 10^{-3} , 5×10^{-3} , 8×10^{-2} , 4×10^{-1}
37. 1.2×10^6 38. 3.5×10^{-1} 39. 7.2×10^{10}
40. 6.3×10^7 41. 3.6×10^{-4} 42. 1.22×10^{-7}
43. 3.6×10^{-4} 44. 1.29×10^{-3} 45. 9.6×10^{-2}
46. 0.0069444 47. 4.356×10^{-1} 48. 2.7225×10^2
49. 27,878,400 50. 1.076×10^{-3} 51. 10,800,000

Practice 8-3

1. $15a^4$ 2. $-32m^{12}$ 3. $\frac{1}{n^{15}}$ 4. a^4 5. 3^{13} 6. $\frac{18}{p^4}$ 7. $p^{13}q^5$
8. $-9a^6b^2$ 9. $-12d^7e^9$ 10. b^2 11. p^9q^2 12. $\frac{1}{n^2}$ 13. $32d^{11}$
14. $\frac{1}{x^4}$ 15. 2^5 16. $r^{10}s^5$ 17. b^{20} 18. $35p^{13}$ 19. 2^2
20. $54r^5s^5$ 21. 4^5 22. $\frac{1}{m^2}$ 23. s^7t^{12} 24. $-9.6x^6y^7$

25. 5^2 26. $\frac{1}{h^{10}}$ 27. t^8 28. f^5 29. $\frac{1}{r^7}$ 30. $\frac{1}{5^2}$
31. 3.5×10^3 32. 9×10^{12} 33. 1.9×10^{-8}
34. 1.64×10^{18} 35. 1.44×10^{-11} 36. 2×10^{11}
37. 3.12×10^{-1} 38. 3.6×10^{15} 39. 4.88×10^{24}
40. 8.4×10^{-11} 41. 4.8×10^{16} 42. 2.7×10^{-6}
43. 4.4×10^{13} 44. 4.5×10^5 45. 2.8×10^{16}
46. 7.2×10^{-14} 47. 1.92×10^{18} 48. 1.3×10^{-7}
49. 1.64×10^{-1} g 50. 1.174×10^{17} mi 51. 3.9×10^9 g
52. 1.18×10^1 in.

Practice 8-4

1. $64a^{15}$ 2. $\frac{1}{2^{12}}$ 3. $\frac{m^{12}}{n^{16}}$ 4. x^{10} 5. 2^{13} 6. $256x^{14}y^6$
7. x^{16} 8. $x^{17}y^{19}$ 9. 5^4 10. $\frac{1}{a^7}$ 11. $\frac{27f^{10}}{g^7}$ 12. x^{18}
13. $\frac{1}{d^8}$ 14. a^6b^{12} 15. x^8y^4 16. $\frac{144}{b^4}$ 17. m^{15} 18. $\frac{y^{10}}{x^5}$
19. y^3 20. $\frac{1}{n^4}$ 21. mn^{20} 22. a^{18} 23. $\frac{1}{b}$ 24. $\frac{16}{s^6}$
25. $625a^{12}b^{20}$ 26. $\frac{1}{b^{18}}$ 27. y^{18} 28. a^4b^6 29. $x^{12}y^3$
30. d^{13} 31. 4×10^{-5} 32. 2.7×10^{-17} 33. 6.4×10^{23}
34. 8.1×10^{15} 35. 3.2×10^{13} 36. 3.43×10^{17}
37. 6.25×10^{22} 38. 8×10^{-9} 39. 8×10^{-9}
40. 8.1×10^{21} 41. 1.5625×10^{-26} 42. 1×10^{25}
43. 5.12×10^{28} 44. 2.16×10^{-1} 45. 1.6×10^{16}
46. 5.79555×10^5 J 47. 1.46×10^7 mi²
48. 3.8×10^5 ft³ 49. 1.44×10^8 ft

Practice 8-5

1. c^6 2. $\frac{y^8}{x^{12}z^{20}}$ 3. $\frac{x^3y^2}{z^5}$ 4. $\frac{a^{10}}{b^{15}}$ 5. 27 6. $\frac{a^{12}}{b^8}$ 7. $\frac{9}{4}$
8. $\frac{q^4}{p^{12}r^{20}}$ 9. $\frac{a^8}{b^{12}}$ 10. 343 11. a^2b^5 12. $\frac{a^{10}}{b^{30}}$ 13. $\frac{64}{9}$
14. z^{10} 15. $25b^8c^6$ 16. $\frac{x^5z^8}{y^{14}}$ 17. $\frac{1}{m^4}$ 18. 1 19. $\frac{s^8}{t^2}$
20. $\frac{32a^{15}}{b^{10}c^{15}}$ 21. $\frac{x^8}{y^2z^8}$ 22. $\frac{1}{h^5}$ 23. $\frac{1}{16}$ 24. $\frac{1}{27}$ 25. $\frac{x^3}{y^6}$
26. $\frac{n^{24}}{m^{12}}$ 27. $\frac{1}{64}$ 28. $\frac{b^{30}}{a^{15}}$ 29. $\frac{1}{n^6}$ 30. $\frac{s^7}{r}$ 31. $\frac{1}{n^{12}}$
32. $\frac{1}{m^2n^2}$ 33. 5.76×10^{-5} 34. 2.52×10^2
35. 2.07×10^4 36. 2×10^4 37. 1.9×10^{-3}
38. 8×10^1 39. 6.08×10^3 40. 2×10^{-11}
41. 4×10^8 42. 1.72×10^9 43. 3.33×10^{-3}
44. 7×10^8 45. 3.68×10^2 46. 3×10^{-5}
47. 7×10^1 48. 4.06×10^{-2} 49. 1.8×10^4 times longer

Chapter 8 Answers (continued)

Practice 8-6

1. 324, 972, 2916 2. 512, -2048, 8192 3. $\frac{9}{8}, \frac{9}{16}, \frac{9}{32}$
4. $\frac{1}{81}, -\frac{1}{243}, \frac{1}{729}$ 5. -20,000, 200,000, -2,000,000
6. $\frac{10}{27}, -\frac{10}{81}, \frac{10}{243}$ 7. $85\frac{1}{3}, 341\frac{1}{3}, 1365\frac{1}{3}$ 8. $\frac{4}{125}, \frac{4}{625}, \frac{4}{3125}$
9. -2.56, -1.024, -0.4096 10. 2.5, 1.25, 0.625 11. geometric
12. arithmetic 13. geometric 14. geometric 15. arithmetic
16. geometric 17. $A(n) = 4 \cdot 3^{n-1}$
18. $A(n) = 2 \cdot (-4)^{n-1}$ 19. $A(n) = 18 \cdot \left(\frac{1}{2}\right)^{n-1}$
20. $A(n) = 1 \cdot \left(-\frac{1}{3}\right)^{n-1}$ 21. $A(n) = -2 \cdot (-10)^{n-1}$
22. $A(n) = 30 \cdot \left(-\frac{1}{3}\right)^{n-1}$ 23. $A(n) = 4^{n-1}$
24. $A(n) = 6 \cdot 2^{n-1}$ 25. $A(n) = 125 \cdot \left(\frac{1}{5}\right)^{n-1}$
26. $A(n) = 50\left(\frac{1}{2}\right)^{n-1}$ 27. 2, 54, 4374
28. 3, 192, 49152 29. 3, 24, 384
30. -1, -125, -78, 125 31. 4, 32, 512 32. $\frac{1}{2}, 4, 64$
33. 0.1, 6.4, 1638.4 34. -2.1, -56.7, -4592.7
35. 10, 1250, 781,250 36. $A(n) = 4 \cdot 3^{n-1}; 972$
37. $A(n) = -2 \cdot \left(-\frac{1}{2}\right)^{n-1}; -0.125$
38. $A(n) = 3 \cdot (-1.2)^{n-1}; -15.47934$
39. $A(n) = 5 \cdot 6^{n-1}; 1080$ 40. $s \cdot 2^8 = 256s$

Practice 8-7

1.

Time	Value of Investment
Initial	\$800
5 yr	\$1200
10 yr	\$1800
15 yr	\$2700
20 yr	\$4050
25 yr	\$6075
30 yr	\$9112.50
35 yr	\$13,668.75

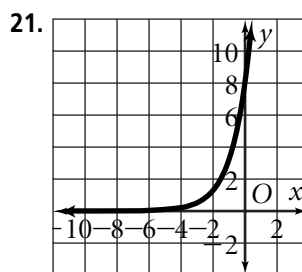
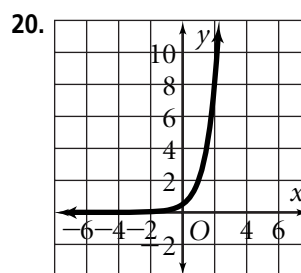
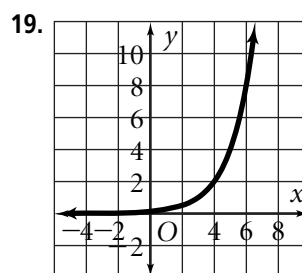
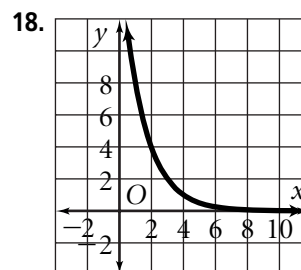
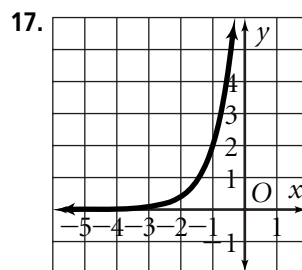
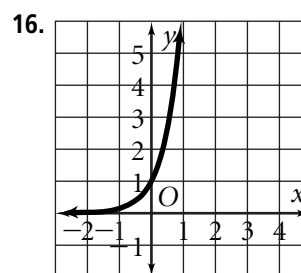
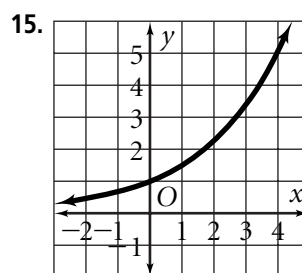
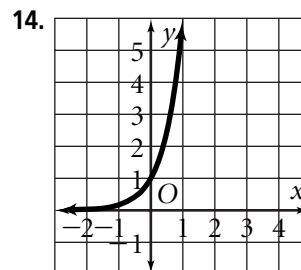
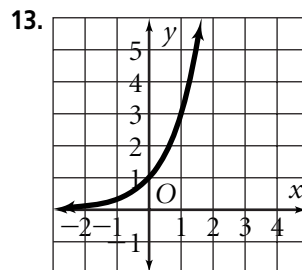
2.

Time	Number of Animals
Initial	18
3 mo	36
6 mo	72
9 mo	144
12 mo	288
15 mo	576
18 mo	1152
21 mo	2304

3.

Time	Amount of Matter
Initial	3200 g
1 yr	1600 g
2 yr	800 g
3 yr	400 g
4 yr	200 g
5 yr	100 g
6 yr	50 g
7 yr	25 g

4. 0.25, 1, 2, 4, 16 5. $\frac{100}{961}, 1, 3.1, 9.61, 92.3521$
6. 1.5625, 1, 0.8, 0.64, 0.4096 7. 0.125, 2, 8, 32, 512
8. $\frac{10}{9}, 10, 30, 90, 810$ 9. 1, 25, 125, 625, 15,625
10. $\frac{9}{4}, 1, \frac{2}{3}, \frac{4}{9}, \frac{16}{81}$ 11. 10,000, 100, 10, 1, $\frac{1}{100}$
12. $\frac{1}{256}, \frac{1}{4}, 2, 16, 1024$



Chapter 8 Answers (continued)

22. 5.5; 166.375; 915.0625 23. 9; 20.25; 30.375
 24. 12; 192; 3072 25. 36; 216; 1296 26. 0.7; 0.343; 0.2401
 27. 3.1; 9.61; 29.791 28. 180; 720; 254.558 29. 0.054; 0.233; 1
 30. 1,000,000; 1000; 1 31. 0.04; 0.008; 625 32. 4 33. 3
 34. -3 35. -3

Practice 8-8

- 1a. $y = 500 \cdot 1.04^x$; \$3553.34 1b. \$25,252.47
 1c. \$1,275,374.90 1d. \$64,412,743.02
 2a. $y = 1500 \cdot 1.0475^x$; \$4785.66
 2b. $y = 1500 \cdot \left(1 + \frac{0.0475}{2}\right)^{2x}$; \$4850.51
 2c. $y = 1500 \cdot \left(1 + \frac{0.0475}{4}\right)^{4x}$; \$4884.02
 2d. $y = 1500 \cdot \left(1 + \frac{0.0475}{12}\right)^{12x}$; \$4906.80
 3a. $y = 25,000 \cdot 1.08^x$; \$27,000 3b. \$31,492.80
 3c. \$36,733.20 3d. \$79,304.23 4a. $y = (0.5)(0.5^{\frac{x}{5700}})$; 0.25 mg
 4b. 0.125 mg 4c. 0.03125 mg 4d. 0.0078125 mg
 5a. $y = 250,000 \cdot 1.035^x$; \$296,921.58 5b. \$329,202.26
 5c. \$352,649.69 5d. \$433,496.51 6a. $y = 4,500,000 \cdot 0.98^x$;
 4,235,364 6b. 4,067,644 6c. 3,676,828 6d. 3,004,236
 7a. $y = 10,500 \cdot 0.85^x$; \$8925 7b. \$7586.25 7c. \$5481.07
 7d. \$2067.18 8a. $y = 2,950,000 \cdot 0.975^x$; 2,876,250
 8b. 2,599,232 8c. 2,017,861 8d. 1,566,525
 9a. $y = 25,000 \cdot 0.88^x$; \$22,000 9b. \$17,036.80
 9c. \$13,193.30 9d. \$10,216.89

Reteaching 8-1

1. $\frac{1}{1000}$ 2. 1 3. $\frac{1}{625}$ 4. $\frac{1}{343}$ 5. $\frac{4}{9}$ 6. $\frac{1}{625x^4}$ 7. $\frac{1}{4}$ 8. 1
 9. $\frac{1}{b^5}$ 10. $\frac{2401}{16}$ 11. $3a$ 12. $-\frac{1}{64}$ 13. $\frac{1}{a^3b^4}$ 14. $\frac{3}{x^2y}$
 15. $\frac{12x}{y^3}$ 16. 128 17. $\frac{1}{12x}$ 18. $\frac{y}{12x^2}$ 19. $\frac{1}{2x^2}$ 20. $\frac{9a^2}{b}$
 21. 1000

Reteaching 8-2

1. 4.2×10^5 2. 5.1×10^9 3. 2.6×10^{11}
 4. 8.3×10^8 5. 7.5×10^{-4} 6. 4.005×10^{-3}
 7. 634,500,000 8. 0.000032 9. 4,081,000 10. 0.002581
 11. 0.0307 12. 1,526,000 13. 0.000804 14. 762,500
 15. 68,250 16. 0.00003081 17. 838.47 18. 0.036245

Reteaching 8-3

1. 5 2. 3 3. 3 4. 1 5. -1 6. -2 7. 12 8. 18 9. -9
 10. $24x^6$ 11. $\frac{18m^6}{a^2}$ 12. $\frac{p^5}{q^9}$ 13. $120x^7$ 14. $8x^7y^3$
 15. $189x^2y^2$ 16. $24y^9$ 17. x^3 18. x^4y 19. $12ab$
 20. $\frac{r^4}{s^2}$ 21. $3pq$

Reteaching 8-4

1. 390,625 2. a^{20} 3. 64 4. $64x^3$ 5. $49a^8$ 6. $27g^6$
 7. $g^{10}h^{15}$ 8. s^{12} 9. x^6y^{12} 10. 1 11. g^2 12. c^{28} 13. 1
 14. $512a^3b^{18}$ 15. x^4y^6 16. x^{14} 17. $9x^4y^2$ 18. $-8x^6$
 19. x^9y^{12} 20. $27x^6y^3$ 21. $-64x^6y^9$ 22. 1 23. $\frac{1}{x^2}$

Reteaching 8-5

1. z^3 2. $\frac{729}{64}$ 3. m 4. $\frac{1}{5}$ 5. b^6 6. $\frac{a^3}{3}$ 7. $\frac{1}{8}$ 8. d^5 9. x^2
 10. 10^{18} 11. $2x$ 12. $\frac{2x^3}{3}$ 13. x^7 14. $\frac{3x^2}{2}$ 15. $\frac{1}{x^5}$ 16. x^8

Reteaching 8-6

1. 512, 2048, 8192 2. -48, 96, -192 3. 1, -1, 1
 4. $\frac{3}{4}, \frac{3}{8}, \frac{3}{16}$ 5. $\frac{5}{4}, -\frac{5}{8}, \frac{5}{16}$ 6. 0.01, 0.001, 0.0001
 7. 1875, 9375, 46,875 8. -40.5, -60.75, -91.125
 9. 121.5, 364.5, 1093.5 10. $\frac{8}{81}, -\frac{8}{243}, \frac{8}{729}$
 11. 112, -224, 448 12. 6.25, 3.125, 1.5625
 13. 2048, 8192, 32,768 14. 4.75, -2.375, 1.1875

Reteaching 8-7

1. 328,050 cans 2. 67,500 3. \$16,000
 4. 1200 cells; 76,800 cells

Reteaching 8-8

1. $y = 5,000 \cdot 1.03^{10}$; 6720 2. $y = 100 \cdot 1.08^5$; \$147
 3. $y = 2 \cdot 1.1^8$; 4 ft 4. $y = 1000 \cdot 0.90^5$; \$590
 5. $y = 5000 \cdot 0.865^8$; \$1567
 6. $y = 20,000 \cdot 0.875^{10}$; \$5262

Enrichment 8-1

1. John Napier

Enrichment 8-2

1. 2^{10} or 1024 2. 2^{40} or 1,099,511,627,776 3. 2^{100}
 4. 93.5 in.^2 5. $7.3758 \times 10^{-29} \text{ in.}^2$ 6a. 4.9907×10^{28}
 6b. 4.1590×10^{27} 6c. 1.3863×10^{27} 6d. 7.8768×10^{23}
 7. yes 8. $9.3 \times 10^7 \text{ mi}$; yes 9. 3.9×10^8 to 5.76×10^8 ; yes
 10. 2.7×10^8 to 1.6×10^{10} ; yes

Enrichment 8-3

1. $P = 32x$; $A = 11x^2$ 2. $P = 29y$; $A = 12y^2$
 3. $P = 16b$; $A = 9b^2$ 4. $P = 14a$; $A = 8a^2$
 5. $P = 224 \text{ units}$; $A = 539 \text{ units}^2$
 6. $P = 87 \text{ units}$; $A = 108 \text{ units}^2$
 7. $P = 64 \text{ units}$; $A = 144 \text{ units}^2$
 8. $P = 70 \text{ units}$; $A = 200 \text{ units}^2$ 9. $96r^2$ 10. $78v^2$

Chapter 8 Answers (continued)

Enrichment 8-4

1. 8.2×10^3 2. 9×10^{-3} 3. 170×10^3 4. 42×10^9
 5. 82×10^{-6} 6. 348.72×10^{-3} 7. 1.2×10^6
 8. 4.5×10^3 9. 27.8×10^3 10. 4.2×10^{-6}
 11. 500.56×10^{-6} 12. 50.04×10^{-9} 13. 2.7
 14. 0.76 15. 10,000 16. 155,000,000,000 17. 0.0001
 18. 50,000 19. 68 20. 235,000

Enrichment 8-5

1. false; $\frac{x^6 z^6}{4y^5}$ 2. false; $\frac{1}{b^8}$ 3. false; $\frac{1}{27y^3}$ 4. true 5. true
 6. false; $\frac{1}{49}$ 7. false; $\left(\frac{b}{a}\right)^{-4}$ 8. false; $(5x - 1)^2$
 9. true 10. false; x^{2y} 11. true 12. true 13. false; a^b
 14. false; $729y^3$ 15. false; 7^{5x} 16. true 17. false; $\frac{8}{x^3 y^9}$
 18. true

Enrichment 8-6

1. 48; 64; Sequence is powers of 2. 2. 24; 25; Sequence is perfect squares. 3. 60, 63; Sequence is $2n + 1$, where n is the previous term. 4. 12; 10; increment between each number in the sequence increased by 1. 5. 120; 125; Sequence is perfect cubes. 6. 24; 32; Sequence is $2n$ where n is the previous term. 7. 6; 3; Each term is divided by 3 to get the next term. 8. 98; 97; Increment between each number in sequence decreased by 1. 9. 50, 52; decreasing in order by $-2, -4, -6$, etc. . . . 10. 4, 7; Each term is divided by 4 to get the next term.

Enrichment 8-7

1. E 2. A 3. D 4. F 5. C 6. G 7. H 8. B

Enrichment 8-8

1. 0.20% 2. 3.1% 3. 2.76% 4. 0.5% 5. about 1796
 6. 0.4% 7. 11.5% 8. about 29189

Chapter Project

Activity 1: Doing

Check students' work.

Activity 2: Recording

Check students' work.

Activity 3: Graphing

Check students' work.

Activity 4: Analyzing

Check students' work.

Activity 5: Interpreting

Check students' work.

✓ Checkpoint Quiz 1

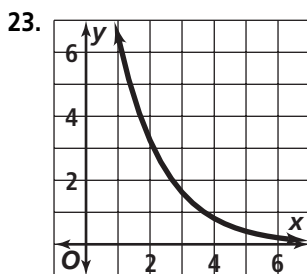
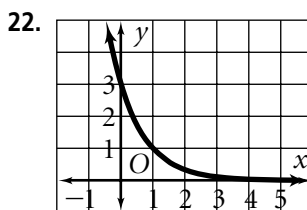
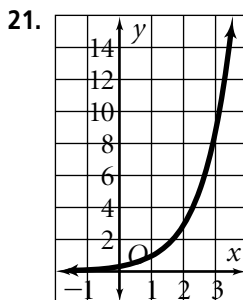
1. $\frac{1}{96}$ 2. x^{18} 3. $16x^{19}$ 4. $\frac{x^4}{y^3}$ 5. $\frac{1}{a}$ 6. $\frac{125x^6}{16}$ 7. $35x^{11}$
 8. $\frac{4096x^{12}}{9}$ 9. ab 10. 5400; 16,200; 145,800
 11a. 1.496×10^8 ; 2.279×10^8 11b. 7.83×10^7 km

✓ Checkpoint Quiz 2

1. 256 2. $\frac{x^{12}}{y^{15}}$ 3. $\frac{y^{10}}{4x^8}$ 4. $\frac{1}{y^{12}}$ 5. arithmetic 6. geometric
 7. geometric 8a. -2 8b. 5 8c. $A(n) = -2 \cdot 5^{n-1}$
 8d. -1250 ; $-781,250$ 9a. $A(n) = 60 \cdot 0.82^{n-1}$
 9b. 27.1 cm

Chapter Test, Form A

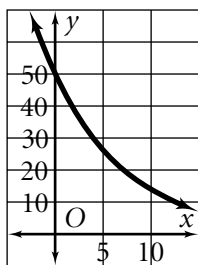
1. $\frac{a^4}{b^7}$ 2. 1.156203 3. $\frac{p^3 r^6}{q^3}$ 4. $\frac{n^{15}}{m^6}$ 5. $\frac{y^7}{x^7}$ 6. $-\frac{u^4}{v^2}$ 7. B
 8. 4.8×10^4 9. 1.19×10^{-1} 10. -7×10^{11}
 11. 8×10^1 12. 5.98×10^{13} btu 13. 1.4×10^8 m
 14a. $-\frac{1}{4}$ 14b. $\frac{5}{16}, -\frac{5}{64}, \frac{5}{256}$ 14c. $A(n) = 80\left(-\frac{1}{4}\right)^{n-1}$
 14d. $-\frac{5}{16,384}$ 15. B 16. B 17. $\frac{4}{7}, 28, 196$ 18. $\frac{1}{9}, 4, 24$
 19. 10, 16.9, 21.97 20. $\frac{15}{4}, \frac{12}{5}, \frac{48}{25}$



24. Answer will vary. Sample: \$2500 at 4% for 3 yr.
 Compounded annually: $y = 2500 \cdot 1.04^x$; \$2812.16 after 3 yr.
 Compounded quarterly: $y = 2500 \cdot 1.01^{4x}$; \$2817.06 after 3 yr.
 25. No; both the factors 3 and (0.25^x) are always positive, so the value of y is always positive. 26a. \$16,000; \$64,000
 26b. $y = 2000 \cdot 2^x$.

Chapter 8 Answers (continued)

27a.



27b. 5.4 yr

28a. $y = 1000 \cdot 1.004^{12x}$ 28b. \$1049.07; \$1100.55

29a. decay 29b. 16.29 min 29c. 7.55 min

30. $x < 0$; the function y is always positive.

Chapter Test, Form B

1. $\frac{x^3 z^4}{y^3}$ 2. $\frac{s}{r^5}$ 3. $2a$ 4. -7.1^2 5. $\frac{2m^2}{n^4}$ 6. $\frac{3r^6}{2t^3}$ 7. D

8. 6.1×10^{-7} 9. 4.4×10^6 10. 3.2×10^{10}

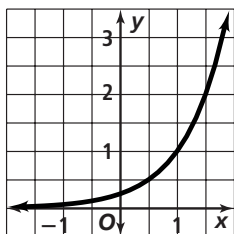
11. 3.4×10^1 12. about 75 13. about 270

14a. $\frac{3}{2}$ 14b. $\frac{81}{32}, \frac{243}{64}, \frac{729}{128}$ 14c. $A(n) = \frac{1}{2} \left(\frac{3}{2} \right)^{n-1}$

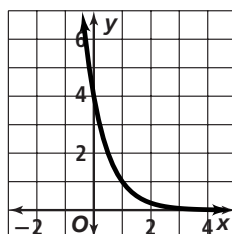
14d. $\frac{6561}{512}$ 15. C 16. D 17. $\frac{1}{8}, 8, 128$ 18. $\frac{3}{256}, 6, 384$

19. 64, 8, 2 20. $\frac{9}{4}, \frac{16}{3}, \frac{256}{27}$

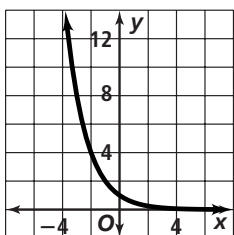
21.



22.

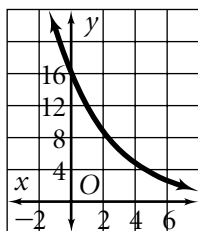


23.



24. Answer may vary. Sample: a quantity that starts at 1500 and decreases 5% every year 25. If the exponent is positive, the number is greater than 1. If the exponent is negative, the number is less than 1. 26a. 3375; 30,375 26b. $y = 125 \cdot 3^x$.

27a.



27b. 2.3 days

28a. $y = 500 \cdot 1.016^{4x}$ 28b. \$567.70; \$686.82

29a. decay; 4% 29b. 52,645. 29c. 11,160. 30. Samantha's work is correct. By definition, $4^{-3} = \frac{1}{4^3}$.

Alternative Assessment, Form C

TASK 1 Scoring Guide:

- 3 Student writes, solves, and graphs problems that clearly demonstrate an in-depth understanding of the mathematical principles involved.
- 2 Student shows a solid understanding of the mathematical principles.
- 1 Student shows a limited understanding of the mathematical principles involved.
- 0 Student makes no attempt, or no solution is present.

TASK 2 Scoring Guide:

- 3 Student selects appropriate values for the variable and solves all parts of the problem with no mistakes.
- 2 Student selects appropriate values for the variable and solves all parts of the problem with only minor mistakes.
- 1 Student either selects inappropriate values for the variable or has significant computational errors.
- 0 Student makes no attempt, or no solution is present.

TASK 3 Scoring Guide:

- 3 Student presents an explanation that thoroughly discusses the appropriate time to use scientific notation. Problem has sufficient detail to augment discussion.
- 2 Student's explanation shows a good degree of understanding of scientific notation. Problem could be more clear or have more detail.
- 1 Student's explanation does not make a clear argument for when or how to use scientific notation.
- 0 Student makes no attempt, or no solution is present.

TASK 4 Scoring Guide:

a. $\frac{2b^3}{a^4}$ b. $\frac{1}{y^5}$ c. $\frac{4}{-3k^3n^5}$ d. $6x^7y^3$ e. $54x^{10}$

3. Student identifies and corrects all errors.
- 2 Student identifies and corrects most errors.
- 1 Student identifies and corrects some of the errors.
- 0 Student makes no attempt, or no solution is present.

Cumulative Review

1. C 2. A 3. D 4. A 5. C 6. A 7. B 8. B 9. B 10. D

11. C 12. A 13. D 14. 500,000 15. $\frac{2}{5}$ 16. \$9.00

17. 6.25% annually for 4 years 18. Answers will vary. Sample: You deposit \$250 in an account which pays 5% interest compounded quarterly. How much will you have in the account after 6 yr? \$336.84 19. (4, -3)

20. Answers may vary. However, the answer must have a slope of $\frac{2}{3}$ but cannot have a y-intercept of -3.

21. $f(x) = 12x - 65.50$