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. $4 \times 10^{-10}, 6 \times 10^{-8}, 7 \times 10^{-7}, 5 \times 10^{-6}$
34. $5.01 \times 10^{-4}, 4.8 \times 10^{-3}, 5.2 \times 10^{-2}, 5.6 \times 10^{-2}$
35. $6.34 \times 10^{-1}, 6.2 \times 10^2, 6.207 \times 10^3$, 62,040
36. $10^{-3}, 5 \times 10^{-3}, 8 \times 10^{-2}, 4 \times 10^{-1}$
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. .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. $15d^4$ **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 mi^2
48. 3.8×10^5 ft^3 **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

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

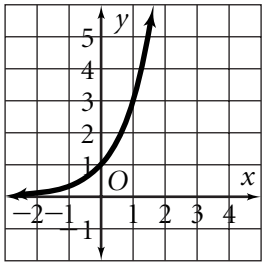
6. 1.5625, 1, 0.8, 0.64, 0.4096 **7.** 0.125, 2, 8, 32, 512

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

13.



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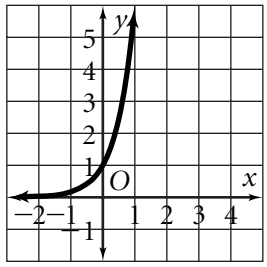

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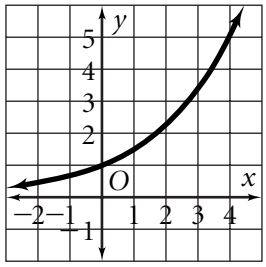

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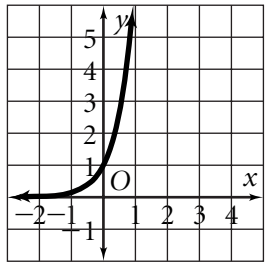

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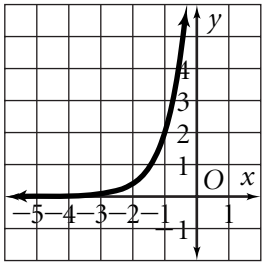

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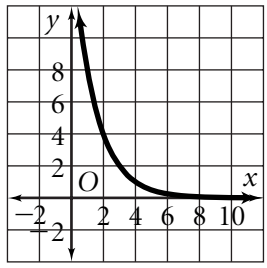

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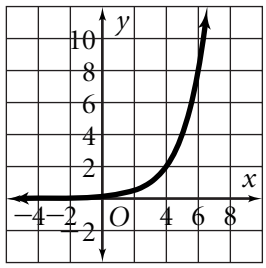

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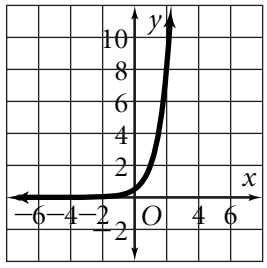

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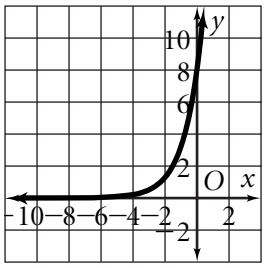


22. 5.5; 166.375; 915.0625 **23.** 9; 20.25; 30.375
24. 12; 192; 3072 **25.** 36; 216; 1296 **26.** 0.7; 0.343; 0.2401
27. 3.1; 9.61; 29.791 **28.** 180; 720; 254.558 **29.** 0.054; 0.233; 1
30. 1,000,000; 1000; 1 **31.** 0.04; 0.008; 625 **32.** 4 **33.** 3
34. -3 **35.** -3

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.** 7.3758×10^{-29} 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.** 9.3×10^7 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. $P = 224$ units; $A = 539$ units^2
6. $P = 87$ units; $A = 108$ units^2
7. $P = 64$ units; $A = 144$ units^2
8. $P = 70$ units; $A = 200$ units^2 **9.** $96r^2$ **10.** $78v^2$

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; $\frac{x^6z^6}{4y^5}$ **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; $\frac{8}{x^3y^9}$
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

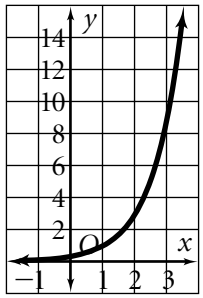
✓ Checkpoint Quiz 2

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.** $\frac{p^3r^6}{q^3}$ **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.** G **17.** $\frac{4}{7}$, 28, 196 **18.** $\frac{1}{9}$, 4, 24
19. 10, 16.9, 21.97 **20.** $\frac{15}{4}, \frac{12}{5}, \frac{48}{25}$

21.



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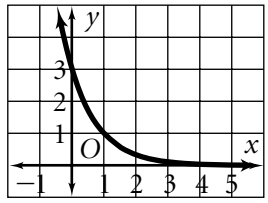
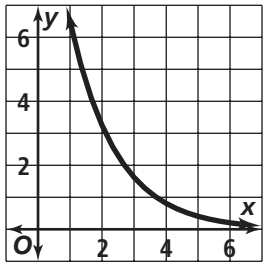
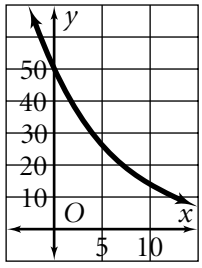


23.



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. $y = 2000 \cdot 2^x$.

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. 1 **2.** 16 **3.** $\frac{1}{64}$ **4.** $\frac{1}{x^3y}$ **5.** $\frac{y^5}{z^7}$ **6.** $\frac{x^2}{64z^5}$ **7.** $\frac{3}{4}$ **8.** $-1\frac{3}{5}$

9. 8.046×10^6 **10.** 9.26×10^{-3} **11.** 0.000742 **12.** 24,500

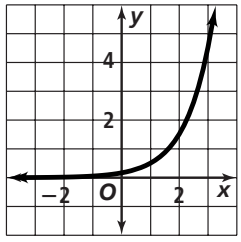
13. $3 \times 10^{-4}, 60 \times 10^{-5}, 7 \times 10^{-3}, 4.8 \times 10^{-2}$ **14.** $24x^9y^2$

15. $-x^{11}y^{12}$ **16.** $-3s$ **17.** $\frac{25}{9n^6}$ **18.** 1.2×10^{11} **19.** 8×10^4

20a. -2 **20b.** $-64; 128; -256$ **20c.** $A(n) = -4 \cdot -2^{n-1}$

20d. geometric **20e.** 2048 **21.** 1.28 **22.** 18 years = \$40,000; 42 years = \$640,000

23.



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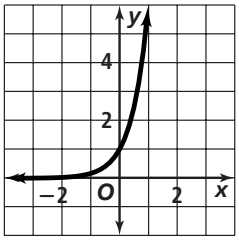

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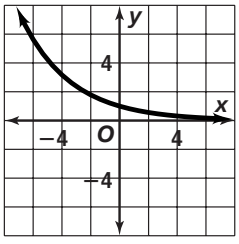

Alternative Assessment, Form C

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.** F **3.** D **4.** F **5.** C **6.** F **7.** B **8.** J **9.** B **10.** J

11a. 1 **11b.** 2.02 **12a.** 42,000,000 **12b.** 4,200,000

13. $9^{-1}, 7^{-1}, 8^0, 9^1, 7^2, \left(\frac{1}{8}\right)^{-2}, 9^2$ **14.** 500,000 **15.** $\frac{2}{5}$

16. \$9.00 **17.** 6.25% annually for 4 years **18.** Answers may 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. $f(x) = 12x - 65.50$