Answers for Lesson 8-1, pp. 433–435 Exercises

1. -1 **2.** $\frac{1}{16}$ **3.** $\frac{1}{25}$

4. $-\frac{1}{25}$ **5.** $\frac{1}{16}$ **6.** $-\frac{1}{81}$

7. $\frac{1}{64}$ **8.** $-\frac{1}{12}$ **9.** 1

10. $\frac{1}{78}$ **11.** $-\frac{1}{64}$ **12.** $-\frac{1}{64}$

13. -2 **14.** 3; 4 **15.** 0; -3

16. -5 **17.** $3a$ **18.** $\frac{5}{x^4}$

19. x^7 **20.** c **21.** $\frac{1}{25p}$

22. $\frac{1}{a^4}$ **23.** $\frac{3}{x^2y}$ **24.** $\frac{7a}{3b^2w}$

25. $\frac{1}{x^5y^7}$ **26.** $\frac{y^7}{x^5}$ **27.** $4c^3$

28. $\frac{7st^3}{5}$ **29.** $\frac{6}{ac^3}$ **30.** $\frac{x^2}{8z^7}$

31. $\frac{y^7}{t^{11}}$ **32.** $\frac{14}{m^2t^5}$ **33.** $\frac{1}{25}$

34. $\frac{1}{9}$ **35.** $-\frac{1}{9}$ **36.** 1

37. $\frac{3}{25}$ **38.** $\frac{1}{100}$ **39.** $\frac{25}{81}$

40. $\frac{81}{25}$ **41.** $-\frac{25}{27}$ **42.** $\frac{1}{25}$

43. -27 **44.** $-\frac{27}{400}$

45. **a.** \$20.48; \$.32

b. No; the value of the allowance rapidly becomes very great.

46. neg. **47.** pos. **48.** pos.

49. neg. **50.** neg. **51.** 10^{-1}

52. 10^{-2} **53.** 10^{-3} **54.** 10^{-4}

55. 10^{-5} **56.** 0.001 **57.** 0.000001

58. 0.7 **59.** 0.03 **60.** 0.0005

61. **a.** $5^{-2}, 5^{-1}, 5^0, 5^1, 5^2$

b. 5^4

c. $\frac{a^n}{1}$

62. D

63. 45 **64.** 6 **65.** 40

66. $\frac{1}{4}$ **67.** $-\frac{1}{243}$ **68.** 16

69. $\frac{2}{9}$ **70.** $\frac{1}{8}$ **71.** $\frac{1}{16}$

72. -1

73.

a	4	$\frac{1}{3}$	6	$\frac{7}{8}$	2
a^{-1}	$\frac{1}{4}$	3	$\frac{1}{6}$	$\frac{8}{7}$	0.5

74. **a.** 1

b. They are reciprocals for $a \neq 0$; $\frac{1}{a^n} = a^{-n}$ and $\frac{1}{a^{-n}} = \frac{1}{\frac{1}{a^n}} = a^n$.

75. A, B, D **76.** Check students' work.

77. No; $3x^{-2} \cdot 3x^2 = 9 \cdot x^0 = 9$. The product of reciprocals should be 1.

78. The student multiplied b by zero instead of raising b to the zero power, which would equal 1.

79. **a.** 1 correct, 0.4096; 2 correct, 0.1536; 3 correct, 0.0256; 4 correct, 0.0016

b. 0 or 1

80. about 4 students; about 16 students; about 29 students

81. $8 - 48m^2$

82. 21

83. $\frac{141}{m^2}$

84. 2.9375

85. $\frac{4}{nr^7y^2}$

86. $-7\frac{1}{4}$

87. 1 and -1

Answers for Lesson 8-2, pp. 438–440 Exercises

1. No; $55 > 10$.

2. yes

3. No; $0.9 < 1$.

4. yes

5. yes

6. No; $46 > 10$.

7. 9.04×10^9

8. 2.0×10^{-2}

9. 9.3×10^6

10. 2.17×10^4

11. 3.25×10^{-3}

12. 8.003×10^6

13. 9.2×10^{-4}

14. 1.56×10^{-2}

15. 500

16. 0.05

17. 2040

18. 720,000

19. 0.897

20. 1.3

21. 0.0000274

22. 0.0048

23. $10^{-3}, 10^{-1}, 10^0, 10^1, 10^5$

24. $6 \times 10^{-10}, 8 \times 10^{-8}, 9 \times 10^{-7}, 7 \times 10^{-6}$

25. $0.52 \times 10^{-3}, 50.1 \times 10^{-3}, 4.8 \times 10^{-1}, 56 \times 10^{-2}$

26. $5300 \times 10^{-1}, 5.3 \times 10^5, 0.53 \times 10^7, 530 \times 10^8$

27. C, A, B

28. 5.6×10^{-2}

29. 2.4×10^{15}

30. 6.0×10^1

31. 3.18×10^{-3}

32. 2.46×10^{-3}

33. 3.4×10^5

34. 5400

35. 7×10^1

36. 1×10^1

37. 4.6×10^{-2}

38. 0.0005

39. 3×10^{-26}

40. Yes; it can be written as 1×10^5.

41. 48 million $= 48 \times 10^6$. Write 48 in scientific notation; then add the powers of 10: $4.8 \times 10^1 \times 10^6 = 4.8 \times 10^7$. 48 millionths $= 48 \times 10^{-6}$. So $4.8 \times 10^1 \times 10^{-6} = 4.8 \times 10^{-5}$.

42. about $\$2.70 \times 10^{12}$

43. 2.796×10^{10} instructions; 1.6776×10^{12} instructions

44. B

45. **a.** 5×10^{14}

b. about 1.6×10^{8} years

46. about 2.61×10^{9} people

47. **a.** 6.08×10^{10} km^3

b. 1.09×10^{12} km^3

c. 9.17×10^{14} km^3

48. $3.\overline{3} \times 10^{-3}$

Answers for Lesson 8-3, pp. 443–445 Exercises

1. 2^{10} **2.** $\frac{2^5}{5^8}$ **3.** 1

4. $(0.99)^3$ **5.** 6^9 **6.** 1

7. c^5 **8.** $3r^5$ **9.** $\frac{10}{t^7}$

10. $56x^6$ **11.** $3x^4$ **12.** $-4.8n^3$

13. b^3 **14.** -7 **15.** $-45a^4$

16. $\frac{y^3}{x}$ **17.** $45x^7y^6$ **18.** $12a^6c^8$

19. $x^{10}y^2$ **20.** a^8b **21.** $-\frac{240m^3}{r}$

22. 6×10^5 **23.** 6×10^9 **24.** 4×10^3

25. 3.4×10^{-5} **26.** 5.6×10^{-7} **27.** 1.5×10^{22}

28. about 2.5578×10^{13} mi

29. 1.08×10^{21} dollars

30. about 3.84×10^5 km

31. 9 **32.** -4 **33.** -3

34. 11 **35.** -5 **36.** 5

37. -4 **38.** 0 **39.** $2, -3$

40. $6x^3 + 2x^2$ **41.** $4x^4$ **42.** $4y^5 + 8y^2$

43. $4c^4$ **44.** $-6x^6$ **45.** $12a^7$

46. x^{10} **47.** $3^4 \cdot 2^2$ **48.** 2.7×10^{-8}

49. 8.0×10^5 **50.** 2.1×10^{-5} **51.** 1.2×10^{-4}

52. 8.0×10^{-8} **53.** 1.5×10^8 **54.** about 1.01 g

55. **a.** $y^1y^7; y^2y^6; y^3y^5; y^4y^4$

b. Answers may vary. Sample: $y^{-1}y^9; y^{-2}y^{10}; y^{-3}y^{11}; y^{-4}y^{12}$

c. An infinite number; there are an infinite number of integer pairs with a sum of 8.

56. **a.** about 10^{-7} m

b. Longer; $1 < 4 < 7$ so $1 \times 10^{-7} < 4 \times 10^{-7} < 7 \times 10^{-7}$.

57. Answers may vary. Sample: The property of multiplying powers only applies when 2 terms have the same base.

58. about 5.85×10^3 m

59. 7.65×10^{14}

60. 4.0392×10^8

61. 7.039305×10^{-7}

62. $1.7882786 \times 10^{-12}$

63. about 6.7×10^{33} molecules

64. 1.428×10^{33} molecules

65. x^3

66. $\frac{1}{a}$

67. $5c^3$

68. $6a^3 + 10a^2$

69. $8m^5 + 56m^3$

70. $-8x^5 + 36x^4$

71. 81

72. 2^{2n+3}

73. $2^{x+y} \cdot 3^{x+2}$

74. $\frac{1}{a + b}$

75. $(t + 3)^2$

76. 25

77. **a.** 1.833×10^{-9} km^3

b. 1.833 m^3

78. 700 times

Answers for Lesson 8-4, pp. 449–451 Exercises

1. c^{10} **2.** c^{10} **3.** n^{32}

4. q^{100} **5.** c^{19} **6.** d^{15}

7. $\frac{1}{t^{14}}$ **8.** x^7 **9.** $625y^4$

10. $1024m^5$ **11.** $49a^2$ **12.** $\frac{1}{12g^4}$

13. $36y^4$ **14.** $81n^{24}$ **15.** $\frac{1}{8y^{12}}$

16. 1 **17.** x^{16} **18.** $8x^5y^3$

19. 1 **20.** $\frac{1}{c^{18}}$ **21.** $9a^6b^8$

22. $\frac{a^{32}}{32c^{26}}$ **23.** 1.6×10^{11} **24.** 9×10^{10}

25. 8×10^{-30} **26.** 8×10^{-9} **27.** 4.9×10^9

28. 3.6×10^{25} **29.** 6.25×10^{-18} **30.** 4.2875×10^{-11}

31. $8.57375 \times 10^{-10}\ \text{m}^3$

32. 3 **33.** -4 **34.** 4

35. -3 **36.** 0 **37.** 8

38. -2 **39.** 0 **40.** -3

41. The student who wrote $x^5 + x^5 = 2x^5$ is correct; x^5 times x^5 is x^{10}.

42. 1 **43.** $243x^3$ **44.** b^{17}

45. $30x^2$ **46.** $\frac{0.16}{x^4}$ **47.** $-8a^9b^6$

48. 9 **49.** 4.3×10^4 **50.** $-256x^4y^5$

51. **a.** $24x^2$; $96x^2$

b. 4 times

c. $8x^3$; $64x^3$

d. 8 times

52. $(mn)^4$ **53.** $(ab)^5$ **54.** $(7xyz)^2$ **55.** $\left(\frac{2x}{y}\right)^2$

56. Check students' work.

57. **a.** 10^6 **b.** 10^9 **c.** 10^9 **d.** 10^{18}

58. **a.** 2^{23} bits

b. 2^{30} bytes; 2^{33} bits

59. **a.** about 5.15×10^{14} m^2

b. about 3.60×10^{14} m^2

c. about 1.37×10^{18} m^3

60. C

61. Add exponents for products of powers as in a^2a^4. Multiply exponents for powers of powers, as in $(a^2)^4$.

62. 3 **63.** 6 **64.** 12

65. 3 **66.** 4 **67.** -5

68. x^{12}; x^{81}; no

Answers for Lesson 8-5, pp. 456–458 Exercises

1. 7 **2.** 1 **3.** -3

4. 0 **5.** $\frac{1}{4}$ **6.** 4

7. $\frac{1}{c^3}$ **8.** m^3 **9.** $\frac{s^2}{2}$

10. y **11.** $\frac{1}{cd^2}$ **12.** $\frac{t^{11}}{27m^4}$

13. 5×10^7 **14.** 3×10^{-5} **15.** 6×10^2

16. 4.2×10^3 **17.** 1.5×10^{-6} **18.** 7×10^{-3}

19. **a.** 3.86×10^{11} h; 2.65×10^8 people

b. about 1457 h

c. about 4.0 h

20. 1×10^{-12} s **21.** $\frac{9}{25}$ **22.** $\frac{1}{x^3}$

23. $\frac{32x^5}{y^5}$ **24.** $\frac{81a^4}{16b^4}$ **25.** $\frac{64}{125}$

26. $\frac{1}{9}$ **27.** $\frac{36}{n^{12}}$ **28.** $\frac{8p^3}{125}$

29. $\frac{3}{2}$ **30.** $\frac{9}{4}$ **31.** $\frac{9}{4}$

32. $-\frac{27}{8}$ **33.** $\frac{9x^8}{225}$ **34.** $\frac{8}{n^3}$

35. $\frac{1}{c^{12}}$ **36.** 1

37. 5^3 simplifies to 125.

38. y^{-2} contains a negative exponent.

39. Each factor should be raised to the 4th power and simplified.

40. x^0 simplifies to 1.

41. The base d should appear only once.

42. $\frac{9}{8}$ **43.** $\frac{1}{16m^{12}}$ **44.** $\frac{1}{25}$

45. a^6 **46.** $\frac{t^6}{27}$ **47.** $\frac{1}{n^{28}}$

48. $\frac{9}{4k^{10}}$ **49.** 49

50. **a.** 9.74×10^7 households; 5.44×10^{11} local calls; 9.7×10^{10} long-distance calls

b. about 5585 local calls

c. about 996 long-distance calls

51. **a.** Answers may vary.

Sample: $\frac{c^4}{c^6}$ can be written as c^{4-6} or c^{-2}; $c^{-2} = \frac{1}{c^2}$.

b. Check students' work.

52. $\frac{a^4}{4b^{10}}$ **53.** $\frac{a^5c^5}{b^3}$ **54.** $\frac{3}{4}$

55. 5 **56.** $\frac{r^5}{p^{25}q^5}$ **57.** 20,736

58. $\frac{y^6}{81}$ **59.** $\frac{3b^5}{5a}$ **60.** H

61. Answers may vary. Sample: You can raise the numerator and denominator to the power and then simplify or simplify and then raise to the power.

62. **a.** about \$12,988

b. about \$20,733

c. about 60%

63. **a.** The student treated $\frac{5^4}{5}$ as $\left(\frac{5}{5}\right)^4$.

b. 125

64. $\left(\frac{3}{5}\right)^5$ **65.** $\left(\frac{m}{n}\right)^7$ **66.** d^3

67. 10^{10} **68.** $\left(\frac{3x}{2y}\right)^3$ **69.** $\left(\frac{2}{13m}\right)^2$

70. $\left(\frac{7m}{5n}\right)^2$ **71.** $\left(\frac{5c}{6}\right)^3$

72. **a.** about 1.2×106 s

b. about 13.9 days

73. **a-b.** Check students' work.

c. No, the power may remain the same or be one less.

74. def. of neg. exponent

75. dividing powers with the same base, def. of neg. exponent

76. raising a quotient to a power

77. mult. powers with the same base

78. raising a power to a power, dividing powers with the same base, def. of neg. exponents

79. n^2 **80.** n^{4x} **81.** x^4 **82.** $\frac{1}{n^2}$

83. **a.**

Distance From the Sun (kilometers)

Planet	Maximum : Minimum
Mercury	$6.97 \times 10^7 : 4.59 \times 10^7 \approx 1.52$
Venus	$1.089 \times 10^8 : 1.075 \times 10^8 \approx 1.01$
Earth	$1.521 \times 10^8 : 1.471 \times 10^8 \approx 1.03$
Mars	$2.491 \times 10^8 : 2.067 \times 10^8 \approx 1.21$
Jupiter	$8.157 \times 10^8 : 7.409 \times 10^8 \approx 1.10$
Saturn	$1.507 \times 10^9 : 1.347 \times 10^9 \approx 1.12$
Uranus	$3.004 \times 10^9 : 2.735 \times 10^9 \approx 1.10$
Neptune	$4.537 \times 10^9 : 4.457 \times 10^9 \approx 1.02$
Pluto	$7.375 \times 10^9 : 4.425 \times 10^9 \approx 1.67$

b. The closer the ratio is to 1, the more circular the orbit.

c. Pluto, Venus

Answers for Lesson 8-6, pp. 463–465 Exercises

1. 4 **2.** 4 **3.** 0.1

4. 2.50 **5.** -0.25 **6.** 2

7. 40, 80, 160 **8.** 48, 96, 192

9. 20.25, 30.375, 45.5625 **10.** -0.5, 0.25, -0.125

11. 0.36, 0.072, 0.0144 **12.** -48, 96, -192

13. geometric **14.** arithmetic

15. geometric **16.** arithmetic

17. arithmetic **18.** geometric

19. 5; 135; 10,935 **20.** -5; -135; $-10{,}935$

21. 5; -135; $-10{,}935$ **22.** 0.5; 13.5, 1093.5

23. -2; -250; $-156{,}250$ **24.** -1.1; 70.4; 18,022.4

25. $A(n) = 6 \cdot 0.5^{n-1}$; 0.375 **26.** $A(n) = -6 \cdot 2^{n-1}$; -3072

27. $A(n) = 7 \cdot (1.1)^{n-1}$; 9.317 **28.** $A(n) = 1 \cdot (-4)^{n-1}$; 4096

29. **a.** $A(n) = 100 \cdot (0.64)^{n-1}$

b. about 10.74 cm

30. $2\frac{2}{3}, \frac{8}{9}, \frac{8}{27}$; $A(n) = 216 \cdot \left(\frac{1}{3}\right)^{n-1}$

31. 1, 0.2, 0.04; $A(n) = 625 \cdot (0.2)^{n-1}$

32. 656.1, 5904.9, 53,144.1; $A(n) = 0.1 \cdot 9^{n-1}$

33. 1, -0.5, 0.25; $A(n) = 16 \cdot (-0.5)^{n-1}$

34. Check students' work.

35. If all consecutive terms have a common difference, the sequence is arithmetic. If all consecutive terms have a common ratio, the sequence is geometric.

36. **a.** 144%; ≈173%; ≈207%

b. $M(z) = (1.2)^z$

37. arithmetic; 3, 1, −1

38. neither; −3, −8, −14

39. geometric; 1.125, 0.5625, 0.28125

40. arithmetic; 20, 22, 24

41. **a.** $A(n) = 36 \cdot (0.9)^{n-1}$

b. 6; $n = 1$ corresponds to the first swing, because $A(1) = 36$.

c. 21.3 cm

42. **a.** $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$

b. $2^{-1}, 2^{-2}, 2^{-3}, 2^{-4}$

c. $r = 2^{-n}$

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

43. No; if a term were 0, then all terms would be 0 because you multiply a term to get the next term.

44. **a.** $1, \frac{3}{4}, \frac{9}{16}, \frac{27}{64}$

b. $r = 1 \cdot \left(\frac{3}{4}\right)^{n-1}$

c. $\frac{243}{1024}$

d. $0, \frac{1}{4}, \frac{7}{16}, \frac{37}{64}$

e. $r = \left[1 - 1 \cdot \left(\frac{3}{4}\right)^{n-1}\right]$

f. $\frac{14{,}197}{16{,}384}$

45. $x; x^5, x^6, x^7$

46. $3x; 27x^4, 81x^5, 243x^6$

47. $xy^2; x^5y^9, x^6y^{11}, x^7y^{13}$

48. $ab; 2a^4b^2, 2a^5b^3, 2a^6b^4$

49. $6 \times 10^{-2}; 2.592 \times 10^{2}, 1.5552 \times 10^{1}, 9.3312 \times 10^{-1}$

50. 5th

Answers for Lesson 8-7, pp. 470–472 Exercises

1. 216 **2.** $\frac{2}{9}$ **3.** 2.5 **4.** 32

5. 4.5 **6.** 115.2 **7.** 1600 **8.** 0.576

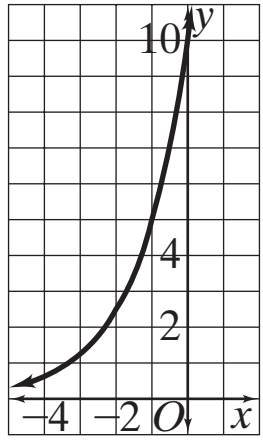
9. \$160,000; \$320,000 **10.** \$2000; \$4000

11. \$16,000, \$32,000

12. A **13.** C **14.** B **15.** B

16. D **17.** C **18.** A

19.



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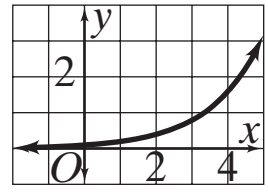

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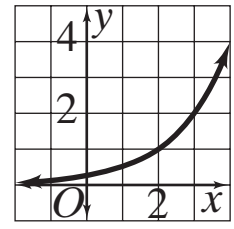

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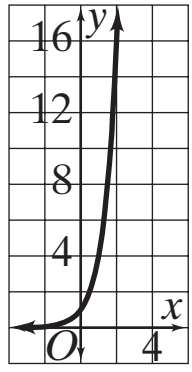

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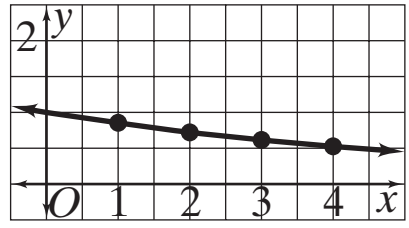

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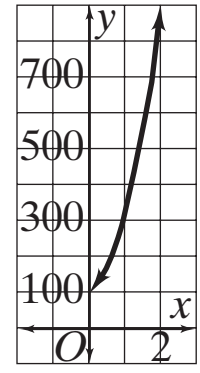


25. 0.04, 0.2, 1, 5, 25, 125; increase

26. 0.16, 0.4, 1, 2.5, 6.25, 15.625; increase

27. 100, 10, 1, 0.1, 0.01, 0.001; decrease

28. 0.3125, 1.25, 5, 20, 80, 320; increase

29. 4, 2, 1, 0.5, 0.25, 0.125; decrease

30. $\frac{9}{4}, \frac{3}{2}, 1, \frac{2}{3}, \frac{4}{9}, \frac{8}{27}$; decrease

31. 0.04, 0.4, 4, 40, 400, 4000; increase

32. $1111.\overline{1}, 333.\overline{3}, 100, 30, 9, 2.7$; decrease

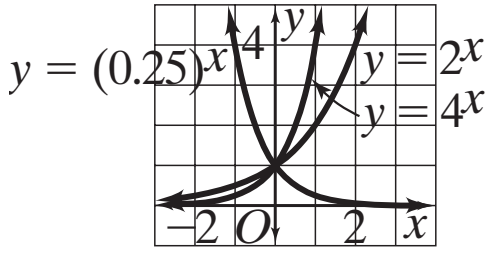
33. B

34. a.

Time	Number of 20-min Time Periods	Pattern	Number of Bacteria Cells
Initial	0	75	75
20 min	1	$75 \cdot 2$	$75 \cdot 2^1 = 150$
40 min	2	$75 \cdot 2 \cdot 2$	$75 \cdot 2^2 = 300$
60 min	3	$75 \cdot 2 \cdot 2 \cdot 2$	$75 \cdot 2^3 = 600$
80 min	4	$75 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	$75 \cdot 2^4 = 1200$
100 min	5	$75 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	$75 \cdot 2^5 = 2400$
120 min	6	$75 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	$75 \cdot 2^6 = 4800$
140 min	7	$75 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	$75 \cdot 2^7 = 9600$

b. $y = 75 \cdot 2^x$, where x is the number of 20-min time periods

35. a.



b. (0, 1)

c. No; there is no value of x for which $y = 0$.

d. If the base is > 1, the graph gets steeper as the base increases. If the base is < 1, the graph gets steeper as the base decreases.

36. a. 1,000,000,000 plants

b. 1,000,000,000,000 plants

37. a.

x	y
1	–2
2	4
3	–8
4	16
5	–32

b. Every other value is negative. The absolute value of each term is double the previous term.

c. No; in $y = a \cdot b^x$, $b > 0$. $-2 < 0$, so it is not exponential.

38. $y = x^5$

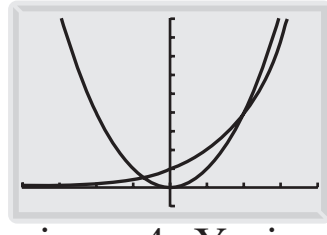
39. $f(t) = 200 \cdot t^2$

40. $y = 3^x$

41. $f(x) = 100x^2$

42. {500}; $b = 1$ produces a linear graph.

43. a.



Xmin=−4 Ymin=−1
Xmax=4 Ymax=9

b. Between $x = 1$ and $x = 3$, the graph of $y = x^2$ rises faster than the graph of $y = 2^x$. The graphs intersect at $x = 2$.

c. The graph of $y = 6^x$ is steeper than $y = x^2$ and $y = 2^x$.

44. 2

45. −3

46. 6

47. 3

48. 4

49. 5

50. a. 4

b. 3

c. $y = 4 \cdot 3^x$

d. $\frac{4}{9}$, 324

Answers for Lesson 8-8, pp. 479–482 Exercises

1. 20; 2

2. 200; 1.0875

3. 10,000; 1.01

4. 1; 1.5

5. **a.** 50,000
b. 0.03; 1.03
c. 1.03
d. 50,000; 1.03; x
e. about 104,689 people

6. 1.04

7. 1.05

8. 1.037

9. 1.0875

10. 1.005

11. 0.75%, 0.25%

12. 1%; $0.\overline{3}$%

13. 1.125%; 0.375%

14. 1.9%; $0.6\overline{3}$%

15. 1.5625%; $0.5208\overline{3}$%

16. \$5352.90

17. \$16,661.35

18. \$634.87

19. \$28,338.18

20. **a.** 4 half-lives
b. 2.5 mCi

21. **a.** 3 half-lives
b. 3.125 mCi

22. 0.5

23. 0.1

24. $\frac{2}{3}$

25. 0.9

26. exp. growth

27. exp. decay

28. exp. growth

29. exp. decay

30. **a.** \$22,000; 0.8
b. $y = 22{,}000 \cdot (0.8)^x$
c. \$5767.17

31. $y = 130{,}000 \cdot (1.01)^x$; about 142,179 people

32. $y = 3{,}000{,}000 \cdot (0.985)^x$; about 2,579,191 people

33. $y = 2400 \cdot (1.07)^x$; \$4721.16

34. $y = 2400 \cdot (1.00583333)^x$; \$4823.19

35. **a.** $y = 584 \cdot (1.065)^x$; \$3862.79

b. Check students' work.

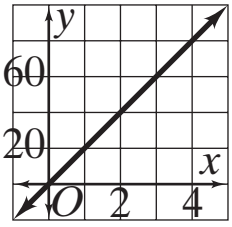
36. Linear function; it is a straight line.

37. Neither; it is not just one straight line.

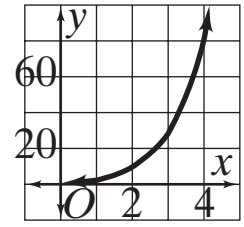
38. Exponential function; it is a curve with y-values that increase as x-values increase.

39. Neither; it decreases and then increases, unlike an exponential function.

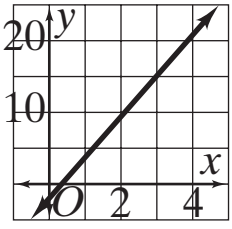
40. linear function



41. exponential function



42. linear function



43. Answers may vary. Sample: \$600; even after 10 years, there is more money in the account with an initial deposit of \$600 (\$977.34) than there is in the account with an initial deposit of \$500 (\$907.01).

44. 6 half-lives

45. 4 half-lives

46. **a.** about 4 h

b. 3.75 mg

c. about 3.7 mg using the function and $15 \text{ mg} \times \frac{1}{4} = 3.75 \text{ mg}$ using the prediction

47. **a.** $y = 6{,}284{,}000 \cdot (1.01)^x$

b. 7,667,674 people

48. 94%

49. 88%

50. 96.5%

51. 46.1%

52. B

53. **a.** \$220.00

b. \$3.96

c. \$223.96

d. \$193.96

e. 9 months

f. \$18.07

54. Check students' work.

55. 2003