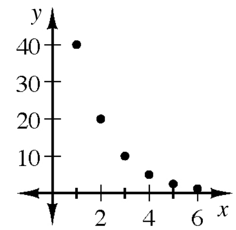
Lesson B.1.1 (Day 1)

B-7. **a:** If s is the price of a can of soup and b is the cost of a loaf of bread, then Khalil's purchase can be represented by $4s + 3b = \$11.67$ and Ronda's by $8s + b = \$12.89$.

b: soup = \$1.35, bread = \$2.09

B-8. Sometimes true; true only when $x = 0$

B-9. **a:** It can be geometric, because if each term is multiplied by $\frac{1}{2}$, the next term is generated.



b: See graph at right.

c: No, because the sequence approaches zero, and half of a positive number is still positive.

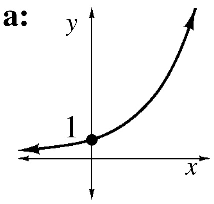
B-10. **a:** 90 cm **b:** 37.97 cm **c:** $t(n) = 160(0.75)^n$

B-11. **a:** $9x^4y^2z^8$ **b:** $\frac{r^3}{s^6t^3}$ **c:** $6m^2 + 11m - 7$ **d:** $x^2 - 6x + 9$

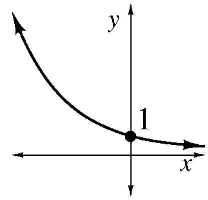
B-12. $\frac{150}{4.5} = \frac{90}{x}$; 2.7 pounds

Lesson B.1.1 (Day 2)

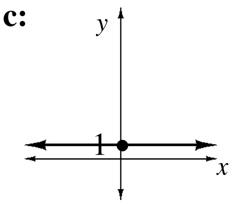
B-13. **a:**



b:



c:



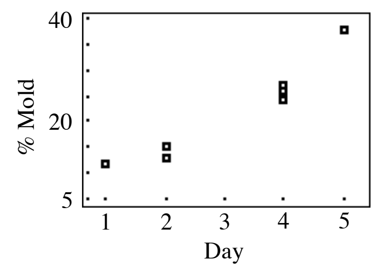
B-14. **a:** $a_1 = 108,\ a_{n+1} = a_n + 12$ **b:** $a_1 = \frac{2}{5},\ a_{n+1} = 2a_n$

c: $t(n) = 3780 - 39n$ **d:** $t(n) = 585(0.2)^n$

B-15. **a:** 1.25 **b:** 0.82 **c:** 1.39 **d:** 0.06

B-16. **a:** No, by observation a curved regression line may be better. See graph below.

b: Exponential growth.



B-17. **a:** 94 years

b: From 1966 to 1999, 429 marbles were added, which means there were 13 marbles added per year.

c: 17

d: $t(n) = 17 + 13n$

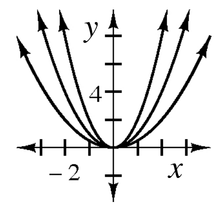
e: In the year 2058, when the marble collection is 153 years old, it will contain more than 2000 marbles.

B-18. $a_n = t(n) = -2 + 6n$

Lesson B.1.2

B-23. **a:** $y = 1.8(3.2)^x$ **b:** $y = 5 \cdot 7^x$

B-24. Answers will vary.



B-25. They are all parabolas, with $y = 2x^2$ rising most rapidly and $y = \frac{1}{2}x^2$ most slowly. See solution graph at right.

B-26. 9 weeks

B-27. **a:** arithmetic $t(n) = 3n - 2$ **b:** neither

c: geometric, $r = 2$ **d:** arithmetic, $t(n) = 7n - 2$

e: arithmetic, $t(n) = n + (x - 1)$ **f:** geometric, $r = 4$

B-28. $a_n = t(n) = 4 \cdot 3^n$

Lesson B.1.3

B-34. Simple interest at 20%, let x = years, y = amount in the account, $y = 500 + 100x$.

B-35. **a:** 15, 375, 1875; $y = 15 \cdot 5^x$

b: 151, 120.8, 61.85; $y = 151(0.8)^x$

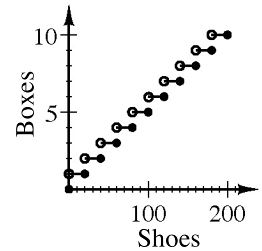
B-36. **a:** 8%, 1.08 **b:** cost $= 150(1.08)^8 = \$277.64$ **c:** $55.15

B-37. **a:** $y = 125000(1.0625)^t$ **b:** $504,052.30

B-38. **a:** (4, –1) **b:** (–1, –2) **c:** Part (b) **d:** Part (a)

B-39. $P(heads) = \frac{1}{2}; P(tails) = \frac{1}{2}$

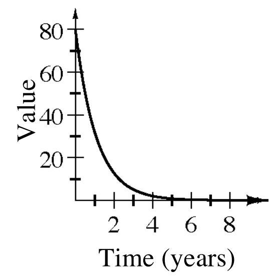
Lesson B.1.4



B-45. See graph at right.

B-46. **a:** 0.40 **b:** \$32, \$2.05 **c:** $V(t) = 80(0.4)^t$

d: It never will. **e:** See graph below right.



B-47. **a:** Let y = youngest child, $y + (y + 5) + 2y = 57$;
The children are 13, 18 and 26 years

b: Let x = months, y = insects, $y = 2x + 105$, $y = 175 - 3x$;
14 months

B-48. **a:** $x^2 - 6x + 9$ **b:** $4m^2 + 4m + 1$

c: $x^3 - 2x^2 - 3x$ **d:** $2y^3 - y^2 + 14y - 7$

B-49. **a:** $3y + 5 = 14, y = 3$ **b:** $3y + 5 = 32, y = 9$

B-50. \$8874

B-51. 0.8%, 9.6%, $y = 500(1.008)^m$

B-52. **a:** $x = -3$ **b:** $x = \frac{1}{2}$

B-53. **a:** $(-8, 2)$ **b:** $\left(\frac{5}{3}, -1\right)$

B-54. $y = \frac{9}{4}x + 9$

B-55. **a:** let x = amount paid, $\frac{8}{5} = \frac{x}{3}$; \$4.80

b: Let a = # adult tickets, s = # student tickets, $3s + 5a = 1770$, $s = a + 30$; 210 adult and 240 student

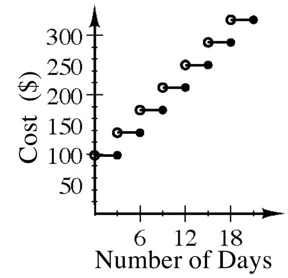
B-56. **a:** sometimes true (when $x = 0$)

b: always true

c: sometimes true (for all x and $y \neq 0$

d: never true

Lesson B.1.5

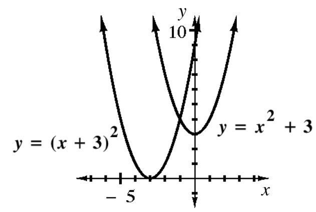


B-59. See graph at right.

B-60. $y = 4(1.75)^x$

B-61. **a:** $y = 500(1.08)^x$ **b:** \$1712.97 **c:** $x \geq 0, y \geq 500$

B-62. Both have the same shape as $y = x^2$, but one is shifted up 3 units and the other is shifted left 3 units. See graph at right.



B-63. **a:** –10 **b:** $\frac{1}{2}$ **c:** –5 **d:** 3

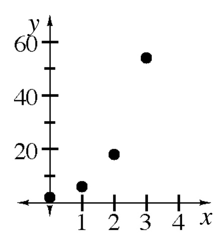
B-64. **a:** $a = 0$ **b:** $m = \frac{16}{17}$ **c:** $x = 10$ **d:** $x = 9, -3$

Lesson B.1.6

B-71. **a:** $y = 281.4(1.02)^5$, 310.7 million people

b: 343.0 million people

c: –34 million people. Population growth has slowed.

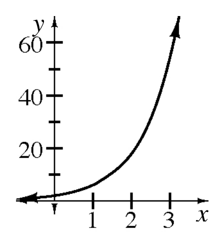


B-72. **a:** $a = 6, b = 2$ **b:** $a = 2, b = 4$

B-73. **a:** $\frac{3x^3}{y^5}$ **b:** $\frac{m^4}{4q^4}$

B-74. **a:** 2, 6, 18, 54

b: See graph shown above right. Domain: non-negative integers

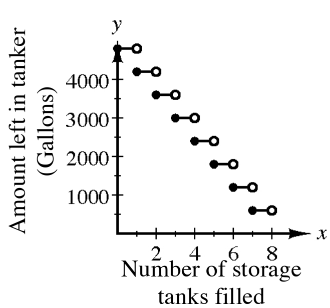


c: See graph shown at right.

d: They have the same shape, but (b) is discrete and (c) is continuous.

B-75. (–3, –6)

B-76. See graph at right.



Lesson B.2.1

B-85. **a:** $y = 2 \cdot 4^x$ **b:** $y = 4(0.5)^x$

B-86. **a:** $a = 3, b = 5$ **b:** $a = 2, b = 3$

B-87. **a:** –4 **b:** 2 **c:** –2 **d:** 10

B-88. Answers will vary.

B-89. Equation: $y = 4x - 12$; intercepts: (3, 0) and (0, –12)

Lesson B.2.2

B-94. **a:** $y = 5 \cdot 1.5^x$ **b:** $y = 0.5(0.4)^x$

B-95. **a:** 2, 4, 8, 16 **b:** 2^n **c:** $\frac{1}{a^{-n}} = a^n$

B-96. **a:** $x = 0$, 1, 2 and $y = -2, 0, 1$ **b:** $-1 \le x \le 1$ and $-1 \le y \le 2$
c: $x \le 2$ and $y \ge -2$ **d:** x: all real numbers and $y \ge -1$

B-97. **a:** $\frac{3}{2}$ **b:** 3 **c:** 6 **d:** 2 **e:** Never; (0.3) **f:** $\frac{2^x}{x}$

B-98. **a:** 16 **b:** 3125 **c:** 2187

B-99. 3

Lesson B.2.3

B-104. $y = 7.68(2.5)^x$

B-105. a: 228 shoppers **b:** 58 people per hour **c:** at 3:00 p.m.

B-106. a: See table at right. The two sequences are the same.

t	1	2	3	4
$t(n)$	12	36	108	324

b: The coefficient is the first term of the sequence, and the exponent is $n - 1$.

c: See table at right.
Yes, both forms create the same sequence.

t	1	2	3	4
$t(n)$	10.3	11.5	12.7	13.9

d: Because the coefficient is the first term of the sequence instead of the zeroth term. Dwayne subtracts one because his equation starts one term later in the sequence, so he needs to multiply or add n one less time.

B-107. $a_n = t(n) = 32\left(\frac{1}{2}\right)^n$

B-108. $a_n = t(n) = 2 \cdot 3^n$

B-109. a: (–2, 5) **b:** (1, 5) **c:** (–12, 14) **d:** (2, 2)