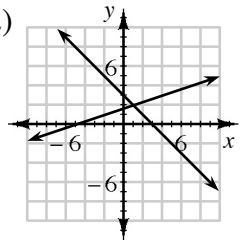
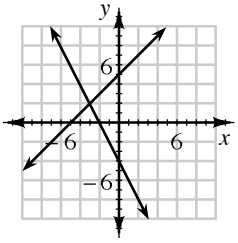
Lesson A.1.1

A-6. **a:** Rabbits: 108; 324 **b:** Rabbits: 12; 48

A-7. **a:** (1, 2) 

b: (–3, 2) 

A-8. **a:** –6 **b:** –2 **c:** $-\frac{2}{3}$ **d:** undefined **e:** $x = 2.25$

A-9. $\frac{27b^3}{a^6}$

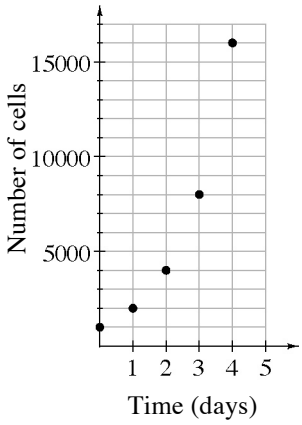
A-10. **a:** x **b:** y^7 **c:** $\frac{1}{4}$ **d:** $64x^6$

A-11. **a:** Sample answers: (3, 0) and (3, 1)
All points on this line have 3 as an x-coordinate. $x = 3$

b: $y = -1$ **c:** $x = 0$

A-12. **a:** curved **b:**

Time (days)	Number of cells
0	1000
1	2000
2	4000
3	8000
4	16,000



A-13. **a:** $5^2 = 25$ **b:** 3^{51}

c: 1 **d:** 1.6×10^{11}

A-14. Jackie squared the binomials incorrectly. It should be: $x^2 + 8x + 16 - 2x - 5 = x^2 - 2x + 1$, $6x + 11 = -2x + 1$, $8x = -10$, and $x = -1.25$.

A-15. **a:** $m = 5$ **b:** $a = \frac{4\pi}{7} \approx 1.80$

A-16. **a:** $y = -2x + 7$ **b:** $y = -\frac{3}{2}x + 6$

A-17. **a:** $\frac{1}{4}$ **b:** $\frac{3}{4}$

Lesson A.1.2

A-22. **a:** $(-1, -2)$ **b:** $(3, 1)$

A-23. **a:** $b = t - an$ **b:** $y = 3(b + a)$ **c:** $y = mx$ **d:** $x = \frac{y}{m}$

A-24. **a:** $2xy^2$ **b:** $-m^3n^3$ **c:** $\frac{1}{m^3n^3}$ **d:** 4×10^{-6}

A-25. **a:** domain: all numbers, range: $y \le 1$ **b:** domain: all numbers, range: $y \ge -1$

c: domain: all numbers, range: $y \le 0$ **d:** domain: all numbers, range: $y \ge -1$

A-26. There is no association between number of pets and age.

A-27. **a:** $y = -\frac{5}{2}x + 10$ **b:** 12.5 inches

Lesson A.1.3

A-34. **a:** Answers vary but should be close to 0.83.

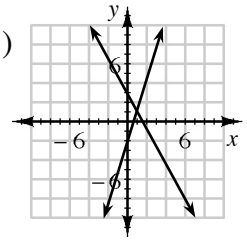
b: Approximately 228 cm. Since DeShawna measured to the nearest centimeter, a prediction rounded to the nearest centimeter would be reasonable.

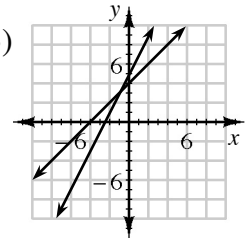
c: Approximately 72 cm.

d: Approximately 166 meters.

e: Approximately 138 meters, approximately 114 meters.

A-35. **a:** $10(0.555) = 5.55$ ft **b:** $10(0.555)(0.555) = 3.08$ ft **c:** $10(0.555)^5 = 0.527$ ft

A-36. **a:** $(1, 1)$ 

b: $(-1, 3)$ 

A-37. **a:** 144, 156, 168, 180 **b:** 264 stamps **c:** $t(n) = 12n + 120$

d: $n = 31.67$; She will not be able to fill her book exactly, because 500 is not a multiple of 12 more than 120. The book will be filled after 32 months.

A-38. They are not on the same line; $m_{AB} = -\frac{1}{5}$, $m_{BC} = -\frac{1}{3}$, $m_{AC} = -\frac{1}{4}$

A-39. **a:** $y = -3x + 7$ **b:** $y = -x - \frac{2}{5}$

A-40. **a:** $y = x + 2$ **b:** 28 grams

Lesson A.2.1

A-45. **a:** $m = 3$ **b:** $m = 6$ **c:** $m = -5$ **d:** $m = 1.5$

A-46. **a:** -3 **b:** $y = -3x - 5$

A-47. 43 ounces

A-48. **a:** 15 cm **b:** $15\sqrt{2} \approx 21.21$ cm

A-49. **a:** One possible answer is that their growth grows linearly.

b: Answers vary. Sample: The sequence of differences between terms turns out to be almost the same as the sequence itself.

A-50. **a:** Exponential, because the ratio of one rebound to the next is roughly constant ≈ 0.6.

b: Roughly geometric, because it has a multiplier.

A-51. **a:** 1 **b:** 5 **c:** $\sqrt{10} \approx 3.16$ **d:** undefined **e:** $x = \frac{38}{3} = 12\frac{2}{3}$

A-52. **a:** $1.03y$ **b:** $0.8z$ **c:** $1.002x$

A-53. **a:** 500 liters **b:** 31.25 liters

A-54. $(-1, -7)$ **b:** $\left(\frac{1}{2}, 2\right)$

A-55. $y = -10x + 170$

A-56. **a:** 4^7 **b:** 1 **c:** $x^{-2} = \frac{1}{x^2}$

d: $\frac{y^6}{x^3}$ **e:** 1.28×10^4 **f:** 8×10^{-3}

Lesson A.2.2

A-66. **a:** Yes, the 90th term or $t(90) = 447$

b: No

c: Yes, the 152nd term or $t(152) = 447$

d: No

e: No, $n = -64$ is not in the domain.

A-67. Answers will vary.

A-68. **a:** $m = 3,\ t(n) = 3n + 1$ **b:** $m = 5,\ t(n) = 5n - 2$

c: $m = -5,\ t(n) = -5n + 29$ **d:** $m = 2.5,\ t(n) = 2.5n + 4.5$

A-69. **a:** Answers will vary. **b:** \$88.58

A-70. $m = 13, b = 17$

A-71. $5b + 3h = 339,\ b = h + 15;$ 48 bouquets and 33 hearts

Lesson A.2.3

A-77. **a:** $-3.5, 1, 5.5, 10$ **b:** Evaluate the equation for $n = 15$.

A-78. $t(n) = 3n + 2.\ t(n+1) = t(n) + 3;\ t(1) = 5$

A-79. $y = \frac{7}{2}x + 2$

A-80. **a:** $16x^2 - 25$ **b:** $16x^2 + 40x + 25$

A-81. Let x = number of months; $2x + 105 = -3x + 130;$ 5 months

A-82. **a:** no solution **b:** $(7, 2)$

A-83. **a:** $12, 7, 2, -3, -8;\ t(n) = 17 - 5n$

b: $32, 16, 8, 4, 2;\ a_n = 64(\frac{1}{2})^n$

Lesson A.3.1

A-87. **a:** exponential, multiply by 12 **b:** linear, add 5

c: other (quadratic) **d:** exponential, multiply by 1.5

A-88. $(2, -4)$

A-89. **a:** $-3, 6, -12, 24, -48$ **b:** $8, 3, -2, -7, -12$ **c:** $2, \frac{1}{2}, 2, \frac{1}{2}, 2$

A-90. Moderate negative linear association with no outliers. The data appear to be in two clusters, probably indicating two classes of vehicles.

A-91. B

A-92. **a:** $y = 2x - 3$ **b:** $y = -3x - 1$ **c:** $y = \frac{2}{3}x - 2$ **d:** $y \approx \frac{5}{2}x + 9$

Lesson A.3.2

A-99. **a:** $y = 2 \cdot 4^x$

Month (x)	0	1	2	3	4	5	6
Population (y)	2	8	32	**128**	**512**	**2048**	**8192**

b: $y = 5 \cdot (1.2)^x$

Year (x)	0	1	2	3	4	5	6
Population (y)	5	6	7.2	**~8.6**	**~10.4**	**~12.4**	**~14.9**

A-100. **a:** 1.03 **b:** 0.75 **c:** 0.87 **d:** 1.0208

A-101. Technically, Mathias can never leave, either because he will never reach the door or because he cannot avoid breaking the rules. The equation for this situation is $y = 100(0.5)^x$, where x is the number of minutes that have passed and y is the distance (in meters) from the door.

A-102. **a:** $8m^5$ **b:** $2y^3$ **c:** $\frac{-2}{3y^5}$ **d:** $-8x^6$

A-103. **a:** #1 is arithmetic, #2 is neither, #3 is geometric

b: #1 the generator is to add –3, #3 the generator is to multiply by $\frac{1}{2}$

A-104. **a:** $-3, -1, 1, 3, 5$ **b:** $3, -6, 12, -24, 48$

A-105. **a:** $x = -\frac{16}{5}$ **b:** no solution **c:** $x = -4$ or 5 **d:** $x = 2$

Lesson A.3.3

A-112. No; the 5^{th} term is 160, and the 6^{th} term is 320. Justifications will vary.

A-113. Yes; $x \approx 5.322$

A-114. a: Sequence 1: $10, 14, 18, 22$, add 4, $t(n) = 4n - 2$
Sequence 2: $0, -12, -24, -36$, subtract 12, $t(n) = -12n + 36$
Sequence 3: $9, 13, 17, 21$, add 4, $t(n) = 4n - 3$

b: Yes, Sequence 1: $18, 54, 162, 486$, multiply by 3, $t(n) = \frac{2}{3}(3)^n$
Sequence 2: $6, 3, 1.5, 0.75$, multiply by $\frac{1}{2}$, $t(n) = 48(\frac{1}{2})^n$
Sequence 3: $25, 125, 625, 3125$, multiply by 5, $t(n) = \frac{1}{5}(5)^n$

c: Answers will vary.

A-115. a: -4 **b:** 6 **c:** 8 **d:** 1040

e: $x = -3, 0, 2$ **f:** $x^3 - 5x - 3$

A-116. a: $y = 23500(0.85)^x$, worth \$2052.82

b: $y = 14365112(1.12)^x$, population 138,570,081

A-117. $t(n) = -188n + 2560$; 1620

A-118. a: all real numbers **b:** $1, 2, 3, \ldots$ **c:** $x \neq 1$ **d:** $2, 3, 4, \ldots$