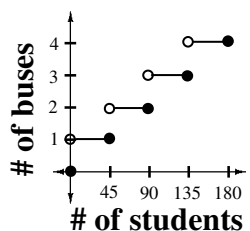

Lesson 1.1.1

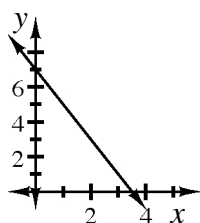
1-4. a: $\frac{1}{2}$, b: 3

1-5. a: $h(x)$ then $g(x)$; b: yes, $g(x)$ then $h(x)$

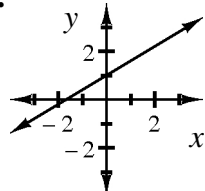
1-6.



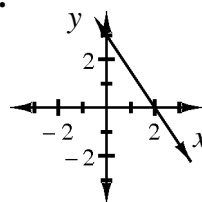
1-7. a:



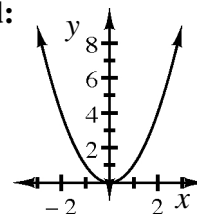
b:



c:



d:



1-8. a: not linear, b: the exponent, c: a parabola

1-9. Sample answer: $y = mx + b$ is a line, b represents the y -intercept, m represents the slope, and (x, y) is the ordered pair for every point on the line.

Lesson 1.1.2

1-13. $y = 2x + 10$

graph:

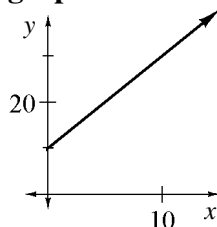


table:

x	0	1	2	3	4
y	10	12	14	16	18

1-14. a: $x = -13$ or $x = 7$, b: $x = \frac{-3}{2}$ or $x = \frac{7}{3}$, c: $x = 0$ or $x = 3$, d: $x = 0$ or $x = 5$,
e: $x = 7$ or $x = -5$, f: $x = \frac{1}{3}$ or $x = -5$

1-15. a: 14, -4, $3x - 1$; b: Multiply by 3 and then subtract 1.

1-16. a: $y = 5x - 2$, b: $x = \frac{2}{5}$

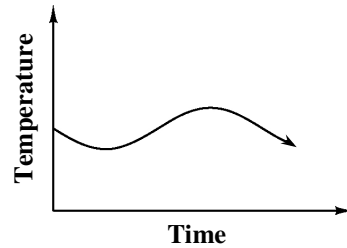
1-17. a: 21, 15, $(0, 15)$, b: -3, 3, $(0, 3)$

1-18. a: 16, b: 9, c: 478.38

1-19. a: y depends on x ; x is independent. Explanations vary.

b: Temperature is dependent; time is independent.

c: sample graph:



1-20. $y = 30 - x$ graph:

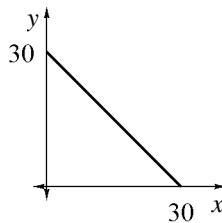
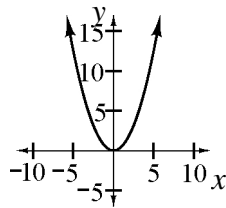


table:

x	0	1	6	20
y	30	29	24	10

1-21. graph:



possible inputs: all real numbers

possible outputs: any number greater than or equal to 0

1-22. a: 1, b: $x = 12$, c: 13, d: $x = \pm\sqrt{7} \approx \pm 2.65$, e: $x = \pm\sqrt{\frac{13}{2}} \approx \pm 2.55$, f: no solution

1-23. Cube each input.

1-24. a: The more gas you buy, the more money you spend. I: gallons, D: dollars.

b: People grow a lot in their early years and then their growing slows down. I: age, D: height.

c: As time goes by, the ozone concentration goes down, although the effect is slowing. I: year, D: ozone.

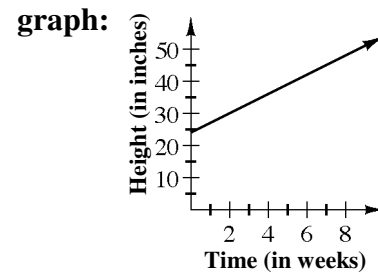
d: As the number of students grows, more classrooms are used and each classroom holds 30 students. I: students, D: classrooms.

e: Possible inputs: x can be any number between and including 0 and 120, possible outputs: $y = 1, 2, 3, 4$.

1-25. a: $y = 3x + 24$

table:

x	y
0	24
1	27
2	30
3	33
4	36
5	39



b: at 16 weeks

c: possible inputs: all numbers greater than and including 0

possible outputs: all numbers greater than and including 24

1-26. Error in line 2: It should be -14 , not $+14$. $x = -37$.

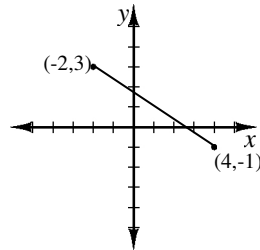
Lesson 1.1.3

1-35. a: the numbers between -2 and 4 inclusive

b: the numbers between -1 and 3 inclusive

c: No; he is missing all the values between those numbers. The curve is continuous, so the description needs to include all numbers, not just integers.

d: sample graph:



1-36. a: 70, b: 2, c: 43, d: undefined, e: $3x^2 + \sqrt{x-5} + 2$, f: $-3x^2 + \sqrt{x-5} + 7$,
g: all real numbers, h: all real numbers greater than or equal to 5,

i: They are different because the square root of a negative is undefined, whereas any real number can be squared.

1-37. Chelita is correct about *how* to find the intercepts, but she makes an error with signs while factoring. The correct equation is $(x - 7)(x - 3) = 0$.

1-38. a: $y = \frac{x-6}{3}$, b: $y = \frac{x+10}{5}$, c: $y = \pm\sqrt{x}$, d: $y = \pm\sqrt{\frac{x+4}{2}}$, e: $y = \pm\sqrt{x} + 5$

1-39. $x + (x + 18) = 84$ or $x + y = 84$ and $y = x + 18$; 33 and 51 meters long

1-40. They are similar by AA. a: $\frac{n}{m}$, b: $\frac{m}{x}$

1-41. a: $x = 13$, b: $x = 8$

Lesson 1.1.4

1-47. (2, 1)

1-48. a: 2, b: 10, c: 100, d: ~ 142.86

1-49. a: $x = 5, 3$; b: $x \approx 3.39, -0.89$ or $x = \frac{5 \pm \sqrt{73}}{4}$

1-50. a: $\sqrt{34} \approx 5.83$ units, b: $\frac{3}{5}$

1-51. Diagrams vary; $y = 3x$.

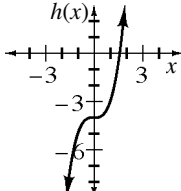
1-52. The error is in line 3. It should be: $0 = 5.4x + 23.7$, $x \approx -4.39$.

1-53. a: $x \approx -7.37$, b: $x = 2.8$

Lesson 1.2.1

1-60. table:

x	$h(x)$
-3	-31
-2	-12
-1	-5
0	-4
1	-3
2	4
3	23

 graph:  domain: $-\infty < x < \infty$
range: $-\infty < x < \infty$
intercepts: (0, -4) and $(\sqrt[3]{4}, 0)$ or $(\sim 1.59, 0)$

1-61. a: ≈ 5.18 m, b: ≈ 18.66 inches, c: $\approx 24.62^\circ$, d: $\sqrt{180} \approx 13.42$

1-62. a: $\sqrt{58} \approx 7.62$ units, b: $-\frac{3}{7}$

1-63. a: domain: $x = -1, 1, 2$, range: $y = -2, 1, 2$

b: domain: $-1 \leq x < 1$, range: $-1 \leq y < 2$

c: domain: $x \geq -1$, range: $y \geq -1$

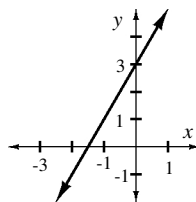
d: domain: $-\infty < x < \infty$, range: $y \geq -2$

1-64. There is an error in line 2. Both sides need to be multiplied by x : $5 = x^2 - 4x$,
 $0 = x^2 - 4x - 5 = (x - 5)(x + 1)$, $x = -1, 5$.

1-65. a: $x = 3, -2$; b: $x = 3, -3$

1-66. a: 2, b: -4, c: $\frac{1}{0}$ is undefined, d: Justifications vary.

1-67. a: $(0, 3)$ and $(-\frac{3}{2}, 0)$, graph:



b: same as part (a)

c: These rules are equivalent, with different notation.

1-68. $x \approx 2.72$ feet, $y \approx 1.27$ feet

1-69. $l = 4w$ and $l + w = 22$ or $w + 4w = 22$. The length is 17.6 cm, and the width is 4.4 cm.

1-70. a: $x = -\frac{1}{17} \approx -0.059$, b: $x = \frac{66}{13} \approx 5.08$, c: $x = -1, 3$

1-71. a: $(-1, 9)$ and $(5, 21)$, b: $x^2 + 17$, c: $x^2 - 4x - 5$

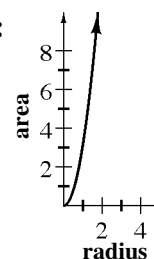
1-72. a: $x = \frac{5(y-1)}{3}$, b: $x = \frac{-2y+6}{3}$, c: $x = \pm\sqrt{y}$, d: $x = \pm\sqrt{y+100}$

1-73. $y = \pi x^2$

table:

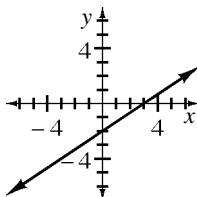
x	0	1	2	3	4
y	0	π	4π	9π	16π

graph:



1-74. a: a line

b: $y = \frac{2}{3}x - 2$, graph:



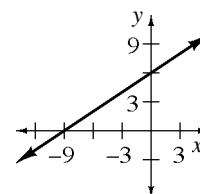
c: Substitute $x = 0$ and solve for y , substitute $y = 0$ and solve for x , $(3, 0)$ and $(0, -2)$.

d: Answers vary.

e: The intercepts are $(-9, 0)$ and $(0, 6)$. Graph shown at right.

1-75. Solve $x^2 + 2x + 1 = 1$. Zero and -2 could have been dropped in.

1-76. $x = 0$; a: $(0, 6)$, b: $(0, 2)$, c: $(0, 0)$, d: $(0, -4)$, e: $(0, 25)$, f: $(0, 13)$

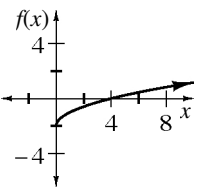


1-77. $x = \frac{12}{7}$; The second line should be $3x + 2 = 10 - 4x + 4$.

Lesson 1.2.2

1-84. (1, 3) and (7, 81)

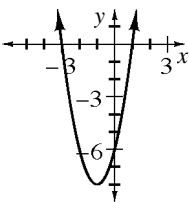
1-85. a: $x = -6$, b: $x = \frac{38}{13} \approx 2.92$

1-86. graph:  intercepts: (0, -2) and (4, 0)
domain: $x \geq 0$
range: $y \geq -2$

1-87. a: -7, b: 3.5, c: the x - and y -intercepts

1-88. a: $x = \frac{y-b}{m}$, b: $r = \pm\sqrt{\frac{A}{\pi}}$, c: $W = \frac{V}{LH}$, d: $y = \frac{1}{3-2x}$

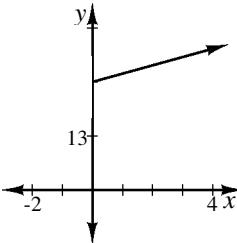
1-89. a: (-2, 0), b: (-10, 0), c: (0, 0), d: $(\pm\sqrt{2}, 0)$, e: (5, 0), f: $(\sqrt[3]{13}, 0)$

1-90. graph:  domain: $-\infty < x < \infty$
range: $y \geq -8$

1-91. a: domain: -2, -1, 2; range: -1, 0, 1; b: domain: $-1 < x \leq 1$, range: $-1 \leq y < 2$;
c: domain: $x > -1$, range: $y > -1$; d: domain: $\infty < x < \infty$, range: $\infty < y < \infty$

1-92. a: table:

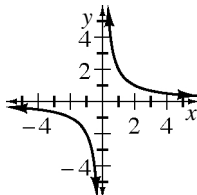
x	y
0	26
1	28
2	30
3	32
4	34

graph:  $y = 2x + 26$

b: 37 weeks after his birthday

1-93. table:

x	y
-3	$-\frac{2}{3}$
-2	-1
-1	-2
-0.5	-4
0	undef.
0.5	4
1	2
2	1
3	$\frac{2}{3}$

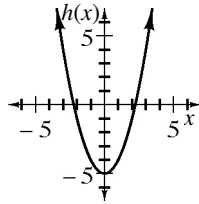
graph: 

Summary statements vary but should be justified using multiple representations

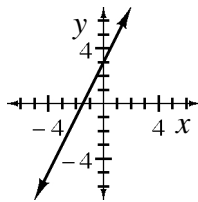
1-94. a: Answers vary; b: When the y -values are the same, they must be equal;
c: $3x + 15 = 3 - 3x$, $x = -2$, d: $y = 9$; e: They cross at the point $(-2, 9)$.

1-95. 7.5 feet

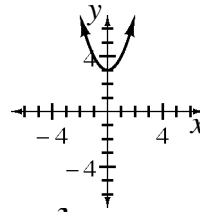
1-96. $(\pm\sqrt{5}, 0)$; graph:



1-97. a:



b:



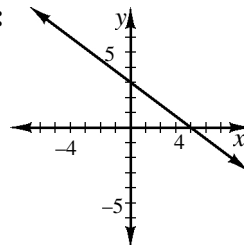
c: y -intercept $(0, 3)$ for both, x -intercept $(-\frac{3}{2}, 0)$ for (a) and none for (b)

d: $(0, 3)$ and $(2, 7)$, solve $2x + 3 = x^2 + 3$ to get $x = 0$ or $x = 2$

1-98. a: 4, b: 2, c: 3, d: 1

Lesson 1.2.3

1-105. $m = -\frac{3}{4}$, $(4, 0)$, $(0, 3)$, graph:

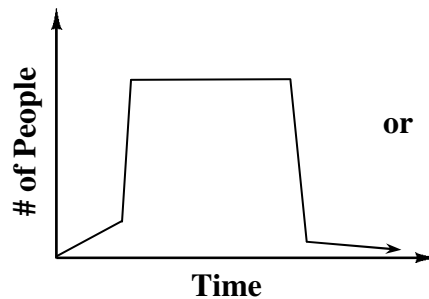


1-106. $y = \frac{3}{2}x - 3$

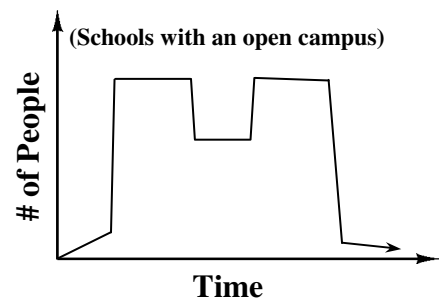
1-107. a: $\frac{-3 \pm \sqrt{21}}{2} \approx -3.79, 0.79$; b: $\frac{7 \pm \sqrt{193}}{6} \approx 3.48, -1.15$

1-108. \$12.00

1-109. sample graphs:



or

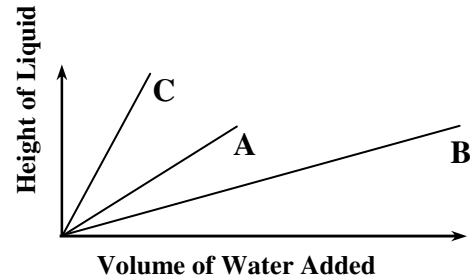


1-110. a: domain: $-2 \leq x \leq 2$, range: $-3 \leq y \leq 2$

b: domain: $x = 2$, range: $-\infty < y < \infty$

c: domain: $x \geq -2$, range: $-\infty < y < \infty$

1-111. The independent variable is the volume of water; the dependent variable is the height of the liquid. The graph is 3 line segments starting at the origin. C is the steepest, and B is the least steep.

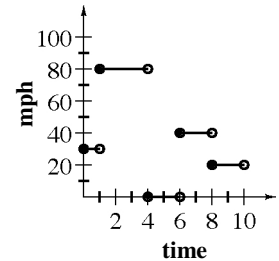


Lesson 1.2.4

1-113. a: a portion of the trip at a specific speed

b: about 400 miles

c: Graph shown at right. A speed of approximately 30 mph for 1 hour, approximately 80 mph for the next 3 hours, 0 mph for 2 hours, approximately 40 mph for 2 hours, and then approximately 20 mph for the last 2 hours. Note that the step graph assumes instantaneous change of speed, which is not technically possible.



1-114. a: 2, b: 4

1-115. $m\angle B = 39.8^\circ$, $\sqrt{244} \approx 15.62$

1-116. 56 inches

1-117. a: 1, 2, 3, 4, 5 or 6; b: $\frac{1}{6}$; c: $\frac{4}{6} = \frac{2}{3}$

1-118. $\frac{1}{52}$, $\frac{51}{52}$

1-119. $\frac{1}{26}$, $\frac{1}{25}$