Chapter 1

Lesson 1.1 Practice Set

1. $2 \times 11x = (2 \times 11)x = 22x$

2. $1.35 \cdot y = 1.35y$

3. $3\times\frac{1}{4}=\frac{3}{1}\times\frac{1}{4}=\frac{3\times1}{1\times2}=\frac{3}{4}$

4. $\frac{1}{4}\bullet z=\frac{1}{4}z$ OR $\frac{z}{4}$

5. $5m + 7$ when $m = 3$
6. $5(3) + 7 = 15 + 7 = 22$

7. $\frac{1}{3}c$ when $c = 63$
8. $\frac{1}{3}(63)=\frac{1}{3}\bullet\frac{63}{1}=\frac{63}{3}=21$

9. $8.15($h$) when h = 43
10. $8.15(43) = $350.45

11. $(k - 11) \div 8$ when $k = 43$
12. $(43 - 11) \div 8 =$
13. $32 \div 8 =$
14. 4
15. Evaluate $(-2)^2 + 3(j)$ when $j = -3$.
16. $(-2)^2 + 3(-3) =$
17. $(-2)(-2) + (-9) =$
18. $4 - 9 =$
19. -5

Evaluate the following when $a = -3$, $b = 2$, $c = 5$, and $d = -4$.

20. $2a + 3b = 2(-3) + 3(2) = -6 + 6 = 0$

21. $4c + d = 4(5) + (-4) = 20 - 4 = 16$

22. $5ac - 2b = 5(-3)(5) - 2(2) = -75 - 4 = -79$

23. $\frac{2a}{c-d}=\frac{2(-3)}{5-(-4)}=\frac{-6}{5+4}=\frac{-6}{9}=-\frac{2}{3}$

24. $\frac{3b}{d} = \frac{3(2)}{-4} = \frac{6}{-4} = -\frac{3}{2}$

25. $\frac{a-4b}{3c+2d} = \frac{-3-4(2)}{3(5)+2(-4)} = \frac{-3-8}{15-8} = \frac{-11}{7} = -\frac{11}{7}$

26. $\frac{1}{a+b} = \frac{1}{-3+2} = \frac{1}{-1} = -1$

27. $\frac{ab}{cd} = \frac{(-3)(2)}{(5)(-4)} = \frac{-6}{-20} = \frac{3}{10}$

Evaluate the following when $x = -1$, $y = 2$, $z = -3$, and $w = 4$.

28. $8x^3 = 8(-1)^3 = 8(-1)(-1)(-1) = -8$

29. $\frac{5x^2}{6z^3} = \frac{5(-1)^2}{6(-3)^3} = \frac{5(-1)(-1)}{6(-3)(-3)(-3)} = \frac{5(1)}{6(-27)} = -\frac{5}{162}$

30. $3z^2 - 5w^2 = 3(-3)^2 - 5(4)^2 = 3(-3)(-3) - 5(4)(4) = 27 - 80 = -53$

31. $x^2 - y^2 = (-1)^2 - (2)^2 = (-1)(-1) - (2)(2) = 1 - 4 = -3$

32. $\frac{z^3+w^3}{z^3-w^3} = \frac{(-3)^3+4^3}{(-3)^3-4^3} = \frac{(-3)(-3)(-3)+(4)(4)(4)}{(-3)(-3)(-3)-(4)(4)(4)} = \frac{-27+64}{-27-64} = -\frac{37}{91}$

33. $2x^2 - 3x^2 + 5x - 4 = -x^2 + 5x - 4 = -(-1)^2 + 5(-1) - 4 = -1 + (-5) - 4 = -10$

34. $4w^3 + 3w^2 - w + 2 = 4(4)^3 + 3(4)^2 - (4) + 2 = 4(64) + 3(16) + 2 = 256 + 48 + 2 = 306$

35. $3 + \frac{1}{z^2} = 3 + \frac{1}{(-3)^2} = 3 + \frac{1}{9} = \frac{3}{1} + \frac{1}{9} = \frac{27+1}{9} = \frac{28}{9}$

36. The number of <u>h</u>ours you work in a week = *h*.

37. The <u>d</u>istance you travel = *d*.

38. The <u>h</u>eight of an object over time = *h*.

39. The <u>a</u>rea of a square = *a*.

40. The number of <u>s</u>teps you take in a minute = *s*.

41. The product of six and v.

42. Four plus y minus six.

43. Sixteen squared.

44. U divided by 3 minus eight.

45. The square root of 225.

46. circumference = $2\pi r = 2(3.14)(1.25) = 7.85$ inches

47. area = length x width = 8.5 x 11 = 93.5 square inches OR 93.5 in^2

48. 16(0.99) = $15.84

49. Let h represent the number of hours she works. Then we can write this equation.

Hourly rate x number of hours = total earned
$4.75h = 124.00$

Now solve for h.

$$\frac{4.75h}{4.75} = \frac{124.00}{4.75}$$

$h \approx 26.11$

Mia worked approximately 26 hours to earn $124.00.

50. Let s = the length of one side of a square. Then area = s^2.
Area = 10^2 = 100 square miles OR 100 mi^2.

Lesson 1.2 Practice Set

1. $8 - (19 - (2 + 5) - 7) = 8 - (19 - (7) - 7) = 8 - (5) = 3$

2. $2 + 7 \times 11 - 12 \div 3 = 2 + 77 - 4 = 75$

3. $(3 + 7) \div (7 - 12) = (10) \div (-5) = -2$

4. $\frac{2 \cdot (3+(2-1))}{4-(6+2)} - (3-5) = \frac{2 \cdot (3+1)}{4-8} - (-2) = \frac{8}{-4} + 2 = -2 + 2 = 0$

5. $8 \cdot 5 + 6^2 = 40 + 36 = 76$

6. $9 \div 3 \times 7 - 2^3 + 7 = 3 \times 7 - 8 + 7 = 21 - 8 + 7 = 20$

7. $8 + 12 \div 6 + 6 = 8 + 2 + 6 = 16$

8. $(7^2 - 3^2) \div 8 = (49 - 9) \div 8 = 40 \div 8 = 5$

9. $\frac{jk}{j+k} = \frac{(6)(12)}{6+12} = \frac{72}{18} = 4$

10. $2y^2 = 2(5)^2 = 2(25) = 50$

11. $3x^2 + 2x + 1 = 3(5)^2 + 2(5) + 1 = 3(25) + 10 + 1 = 75 + 10 + 1 = 86$

12. $(y^2 - x)^2 = (1^2 - 2)^2 = (1 - 2)^2 = (-1)^2 = 1$

13. $\frac{4x}{9x^2 - 3x + 1} = \frac{4(2)}{9(2)^2 - 3(2) + 1} = \frac{8}{9(4) - 6 + 1} = \frac{8}{36 - 6 + 1} = \frac{8}{31}$

14. $\frac{z^2}{x+y} + \frac{x^2}{x-y} = \frac{(4)^2}{1+(-2)} + \frac{(1)^2}{1-(-2)} = \frac{16}{-1} + \frac{1}{3} = \frac{-48+1}{3} = -\frac{47}{3}$

15. $\frac{4xyz}{y^2 - x^2} = \frac{4(3)(2)(5)}{(2)^2 - (3)^2} = \frac{120}{4-9} = \frac{120}{-5} = -24$

16. $\frac{x^2 - z^2}{xz - 2x(z-x)} = \frac{(-1)^2 - 3^2}{(-1)(3) - 2(-1)(3-(-1))} = \frac{1-9}{-3+2(4)} = \frac{-8}{5} = -\frac{8}{5}$

17. $V = \frac{s^2(h)}{3} = \frac{4^2(18)}{3} = \frac{288}{3} = 96$ cubic inches OR 96 in^3

18. $V = \frac{s^2(h)}{3} = \frac{10^2(50)}{3} = \frac{100(50)}{3} = \frac{5000}{3} = 1{,}666.7$ cubic feet OR 1,666.7 ft^3

19. $V = \frac{s^2(h)}{3} = \frac{12^2(7)}{3} = \frac{144(7)}{3} = \frac{1008}{3} = 336$ cubic meters OR 336 m^3

20. $V = \frac{s^2(h)}{3} = \frac{13^2(27)}{3} = \frac{169(27)}{3} = \frac{4563}{3} = 1{,}521$ cubic feet OR 336 ft^3

21. $V = \frac{s^2(h)}{3} = \frac{16^2(90)}{3} = \frac{256(90)}{3} = \frac{23{,}040}{3} = 7{,}680$ cubic centimeters OR 7,680 cm^3

22. 5 – 2 · [6 – (4 + 2)] = 5
5 – 2 · [6 – 6] = 5
5 – 2 · 0 = 5
5 – 0 = 5
5 = 5

23. (12 ÷ 4) + 10 – (3 · 3) + 7 = 11
3 + 10 – 9 + 7 = 11
3 + 1 + 7 = 11
4 + 7 = 11
11 = 11

24. 22 – [32 – 5 · (3 - 6)] = -25
22 – [32 – 5 (-3) = -25
22 – [32 + 15] = -25
22 – 47 = -25
-25 = -25

25. 12 – (8 – 4) · 5 = –8
12 – 4 · 5 = –8
12 – 20 = –8
–8 = –8

26. $x^2 + 2x - xy = (250)^2 + 2(250) - (250)(-120) = 62{,}500 + 500 + 30{,}000 = 93{,}000$

27. $(xy - y^4)^2 = ((0.02)(-0.025) - (-0.025)^4)^2 = (-0.0005 - 0.000000390625)^2 =$
$(0.0004996)^2 = 0.0000002496$

28. $\dfrac{x+y-z}{xy+yz+xz}=\dfrac{\frac{1}{2}+\frac{3}{2}-(-1)}{(\frac{1}{2})(\frac{3}{2})+(\frac{3}{2})(-1)+(\frac{1}{2})(-1)}=\dfrac{3}{\frac{3}{4}-\frac{3}{2}-\frac{1}{2}}=\dfrac{3}{\frac{3-6-2}{4}}=\dfrac{3}{\frac{-5}{4}}=\dfrac{3}{1}(\dfrac{4}{-5})=-\dfrac{12}{5}$

29. $\dfrac{(x+y)^2}{4x^2-y^2}=\dfrac{(3+(-5d))^2}{4(3)^2-(-5d)^2}=\dfrac{9-30d+25d^2}{36+25d^2}$

30. $V=\dfrac{4}{3}\pi r^3=\dfrac{4}{3}\pi(9)^3=\dfrac{4}{3}\pi(729)=3{,}053.63$ cubic centimeters OR 3,053.63 cm^3

31. $x = -1$, so $-9x + 2 = -9(-1) + 2 = 9 + 2 = 11$

32. $A=\dfrac{h}{2}(a+b)=\dfrac{8}{2}(10+15)=4(25)=100$ square centimeters OR 100 cm^2

33. $A=\pi r^2=\pi(17)^2=289\pi\approx 907.46$ square inches OR 907.46 in^2

Lesson 1.3 Practice Set

1. Sixteen more than a number = $x + 16$
2. The quotient of h and 8 = $\frac{h}{8}$
3. Forty-two less than y = $y - 42$
4. The product of k and three = $3k$
5. The sum of g and –7 = g + (–7)
6. r minus 5.8 = $r - 5.8$
7. 6 more than 5 times a number = $5x + 6$
8. 6 divided by a number minus 12 = $\frac{6}{x-12}$
9. A number divided by –11 = $\frac{x}{-11}$
10. 27 less than a number times four = $4x - 27$
11. The quotient of 9.6 and m = $\frac{9.6}{m}$
12. 2 less than 10 times a number = $10x - 2$
13. The quotient of d and five times s = $\frac{d}{5s}$
14. 35 less than x = $x - 35$
15. The product of 6, –9, and u = $(6)(-9)u$ OR $-54u$
16. $j - 9$ = a number minus 9
17. $\frac{n}{14}$ = a number divided by 11
18. $17 - a$ = a number less than 17
19. $3l - 16$ = three times a number minus sixteen

20. $\frac{1}{2}(h)(b)$ = one-half the product of two numbers

21. $\frac{b}{3}+\frac{z}{2}$ = a number, *b*, divided by three added to a number, *z*, divided by 2

22. $4.7 - 2f$ = four and seven tenths less the product of two and a number

23. $5.8 + k$ = the sum of five and eight tenths and a number

24. $2l + 2w$ = two times a number, *l*, plus two times a number, *w*

25. Let *u* represent the unit cost of the items purchased. Then

$$u = \frac{\text{total cost}}{\text{number of objects}} = \frac{14.50}{n}$$

26. Let *a* = area of the square and *s* = length of one side. Then $a = s^2$

27. Let *l* = the length of ribbon and let *f* = number of outfits. (Note: any variable will work, but I avoided *o* because of the similarity with 0.)
$l = 15f$

28. Let *t* = total chocolate squares and *s* = squares that have been eaten. (Note: using the variable *e* is not a good idea, as in mathematics, *e* represents a number, i.e. $e \approx 2.718281828\ldots$)

$t = 16 - s$

29. There are many possible answers. One such example is below.
Let *h* = the number of helium balloons
Sally has a number of helium balloons, *h*, and her mom buys 9 more for her.

30. The variable is already defined as *m*. The expression would be written as $\frac{7}{m}-\frac{m}{7}$.

31. a) The pattern is that to get to the next amount, one should start with 65 games packaged for the first worker and add 22 games packaged for each additional worker.
b) The expression for the number of games packaged would be $65 + 22w$ if *w* = the number of workers.

32. a) The total pay is 15 dollars for the first hour and 7 dollars for every hour after that.
b) If *h* = the number of hours, then the expression becomes $15 + 7h$.

33. a) To find the number of bacteria, raise the number of hours as a power of 2.
b) Let b = number of bacteria and h = number of hours. Then $b = 2^h$.

34. a) Let s = the number of seats on the ferris wheel. Then the number of people, p, on the ferris wheel is $p = 2s$.
b)If there are 17 seats filled, then $p = 2(17) = 34$ people.

35. The expression was 28 x p, where p = the number of people. If p = 2,518, then the amount of revenue is 28(2,518) = $70,504.

36. 10 + 6 ÷ 2 – 3 = 5
(10 + 6) ÷ 2 – 3 = 5

37. $5x^2 - 4y$ when $x = -4$ and $y = 5$
$5(-4)^2 - 4(5) = 5(16) - 20 = 80 - 20 = 60$

38. $\dfrac{x^2 y^3}{x^3 + y^2}$ when $x = 2$ and $y = -4$

$$\frac{x^2 y^3}{x^3 + y^2} = \frac{2^2(-4)^3}{2^3 + (-4)^2} = \frac{4(-64)}{8+16} = \frac{-256}{24} = -\frac{32}{3}$$

39. $2 - (t - 7)^2 \times (u^3 - v)$ when $t = 19$, $u = 4$, and $v = 2$
$2 - (19 - 7)^2 \times (4^3 - 2) = 2 - (12)^2 \times (64 - 2) = 2 - 144 \times 62 = 2 - 8928 = -8926$

40. $2 - (19 - 7)^2 \times (4^3 - 2) = 2 - (12)^2 \times (64 - 2) = 2 - 144 \times 62 = 2 - 8928 = -8926$

Lesson 1.4 Practice Set

1. The value (or multiple values) that make the equation or inequality true.

2. An algebraic equation uses an equal sign, and an algebraic inequality uses the symbols $<$, $>$, $\leq$, $\geq$, or $\neq$.
   Equation: $3x + 4 = 12$
   Inequality: $2y - 5 < -34$

3. $<$, $>$, $\leq$, $\geq$, and $\neq$

4. let y = the amount of yard
   Then the amount Peter earns = 0.20(the amount of yard) + the charge per job
   $25 = 0.20y + 10$

5. let p = number of people
   Then total costs = 4(the number of people) + initial charge
   $324 = 4p + 200$

6. let m = the number of miles
   Then total rental cost = 0.45(the number of miles) + the initial charge
   $100 = 0.45m + 55$

7. let b = total number of blocks
   Then the total number of blocks = the amount Peter already has + the amount Nadia gives him
   $b = 7 + 4$

8. let p = the number of passengers
   Then $p \leq 65$.

9. let n = the first integer
   Then the sum of the integers = the first integer + the next integer = $n + (n + 1)$.
   So $n + (n + 1) < 54$.

10. Let I = the interest earned, r = the annual interest rate, and p = the amount of money invested, and t = time (in years). We do not know p, and we know $I \geq 250$, r = 0.05, and $t = 1$.

    $0.05p \geq 250$

11. Let h = the number of hamburgers you can eat.
    Then $0.49h \leq 3$

    To check to see if a value is a solution, follow these steps.
    1. Substitute the value in for the variable into the original equation.
    2. Keep one side of the equation or inequality is unchanged.

3. Simplify the other side until it is a single number.
4. Check to see if the values make a true statement.
5. If the statement is true, the value is a solution. If the statement is false, double-check your work. If the work is good, then the value is not a solution.

12. $a = -3$; $4a + 3 = -9$
Check: $4(-3) + 3 = -9$
$-12 + 3 = -9$
$-9 = -9$ ✔

13. $x = \frac{4}{3}$; $\frac{3}{4}x + \frac{1}{2} = \frac{3}{2}$
Check: $\frac{3}{4}\left(\frac{4}{3}\right) + \frac{1}{2} = \frac{3}{2}$
$\frac{12}{12} + \frac{1}{2} = \frac{3}{2}$
$\frac{2}{2} + \frac{1}{2} = \frac{3}{2}$
$\frac{3}{2} = \frac{3}{2}$ ✔

14. $y = 2$; $2.5y - 10.0 = -5.0$
Check: $2.5(2) - 10.0 = -5.0$
$5 - 10.0 = -5.0$
$-5.0 = -5.0$ ✔

15. $z = -5$; $2(5 - 2z) = 20 - 2(z - 1)$
In this case, you will have to simplify both sides.
Check: $2(5 - 2(-5)) = 20 - 2((-5) - 1)$
$2(5 + 10) = 20 - 2(-6)$
$2(15) = 20 + 12$
$30 = 32$ ✘

16. $x = 12$; $2(x + 6) \le 8x$
Check: $2(12 + 6) \le 8(12)$
$2(18) \le 96$
$36 \le 96$ ✔

17. $z = -9$; $1.4z + 5.2 > 0.4z$
Check: $1.4(-9) + 5.2 > 0.4(-9)$
$-12.6 + 5.2 > -3.6$
$-7.2 > -3.6$ ✗

18. $y = 40$; $-\frac{5}{2}y + \frac{1}{2} < -18$
Check: $-\frac{5}{2}(40) + \frac{1}{2} < -18$
$\frac{-200}{2} + \frac{1}{2} < \frac{-36}{2}$
$\frac{-199}{2} < \frac{-36}{2}$ ✓

19. $t = 0.4$; $80 \geq 10(3t + 2)$
Check: $80 \geq 10(3(0.4) + 2)$
$80 \geq 10(1.2 + 2)$
$80 \geq 10(3.2)$
$80 \geq 32$ ✓

20. $m + 3 = 10$
$\quad -3 \quad -3$
$m = 7$

21. $\frac{6 \times k}{6} = \frac{96}{6}$
$k = 16$

22. $9 - f = 1$
$+9 \quad +9$
$(-1) - f = 10(-1)$
$f = -10$

23. $\frac{8h}{8} = \frac{808}{8}$
$h = 101$

24. $a + 348 = 0$
$\quad -348 \quad -348$
$a = -348$

25. There are many possible solutions. The inequality is $2.5b + 1.75f \leq 25.00$, where b = the number of burgers and f = the number of fries

If $b = 5$ and $f = 5$, then $2.5(5) + 1.75(5) \leq 25$

$12.5 + 6.25 \leq 25$

$19 \leq 25$

If $b = 6$ and $f = 5$, then $2.5(6) + 1.75(5) \leq 25$

$15 + 6.25 \leq 25$

$21.25 \leq 25$

If $b = 5$ and $f = 7$, then $2.5(5) + 1.75(7) \leq 25$

$12.5 + 12.75 \leq 25$

$24.75 \leq 25$

26. $\frac{1.59a}{1.59} < \frac{7}{1.59}$

$a < 4.40$ lbs

27. Let s = number of sliders

Then $s = 5(7) = 35$ sliders

28. Let l = the price of the Lexus

Then $\frac{0.27l}{0.27} = \frac{15000}{0.27}$

$l = \$55{,}555.56$

29. Let s = the amount of sales

Then you want to know when $1000 + 0.06s > 1200 + 0.05s$

$1000 + 0.06s > 1200 + 0.05s$

$\quad - 0.05s \qquad - 0.05s$

$1000 + 0.01s > 1200$

$-1000 \qquad -1000$

$\frac{0.01s}{0.01} > \frac{200}{0.01}$

$s > 20{,}000$

30. $\frac{1.75f}{1.75} \leq \frac{25}{1.75}$

$f \leq 14$

31. 17 less than a number is 65

$x - 17 = 65$

32. $3^4 \div (9 \times 3) + 6 - 2$

$81 \div (9 \times 3) + 6 - 2$

$81 \div 27 + 6 - 2$

$3 + 6 - 2$

7

33. $A = \frac{1}{2} \cdot b \cdot h = \frac{1}{2} bh$

34. $V = 4x(10 - x)^2$ when $x = 2$

$V = 4(2)(10 - 2)^2$

$V = 8(8)^2$

$V = 8(64)$

$V = 512$ cubic inches

Lesson 1.5 Practice Set

1. $y = \frac{5}{6}x - 2$ becomes $f(x) = \frac{5}{6}x - 2$

2. To allow one to easily decipher between the equations

3. domain – all the possible input values for the independent variable

4. This is false. Range – all the possible input values for the dependent variable

5.

x	$f(x)$	Work shown
–5	–27	$-(x)^2 - 2 = -(-5)^2 - 2 = -25 - 2 = -27$
–4	–18	$-(x)^2 - 2 = -(-4)^2 - 2 = -16 - 2 = -18$
–3	–11	$-(x)^2 - 2 = -(-3)^2 - 2 = -9 - 2 = -11$
–2	–6	$-(x)^2 - 2 = -(-2)^2 - 2 = -4 - 2 = -6$
–1	–3	$-(x)^2 - 2 = -(-1)^2 - 2 = -1 - 2 = -3$
0	–2	$-(x)^2 - 2 = -(0)^2 - 2 = 0 - 2 = -2$
1	–3	$-(x)^2 - 2 = -(1)^2 - 2 = -1 - 2 = -3$
2	–6	$-(x)^2 - 2 = -(2)^2 - 2 = -4 - 2 = -6$
3	–11	$-(x)^2 - 2 = -(3)^2 - 2 = -9 - 2 = -11$
4	–18	$-(x)^2 - 2 = -(4)^2 - 2 = -16 - 2 = -18$
5	–27	$-(x)^2 - 2 = -(5)^2 - 2 = -25 - 2 = -27$

6. a) Let p = the price of the car and w = the number of weeks
   Then $p = 515.85 + 62w$
   b) The domain cannot be all real numbers because the price would not be negative.
   c) $p = 515.85 + 62w$
   $1795 = 515.85 + 62w$
   $-515.85 \quad -515.85$
   $\frac{1279.15}{62} = \frac{62w}{62}$
   $w = 20.6$
   She will need to save approximately 21 weeks.

7. Let t = total earned and h = the number of hours
   Then the equation would be $t = 10h$
   The domain would be all the values that h could be, or the number of hours Dustin would work. Since it does not make sense for Dustin to work negative hours, the domain is $h \geq 0$, or all real numbers greater than or equal to 0.

8. Let c = the total cost to the customer for tutoring and h = the number of hours Maria tutors.
The equation would be $c = 25h + 15$.
As in the previous item, Maria would not work negative hours, so domain is $h \geq 0$.

9. $f(x) = 15x - 12$; Since there are no variables in the denominator, or no variables under a radical sign, there are no restrictions on the domain. The domain is all real numbers, or $-\infty < x < \infty$.

10. $f(x) = 2x^2 + 5$; Since there are no variables in the denominator, or no variables under a radical sign, there are no restrictions on the domain. The domain is all real numbers, or $-\infty < x < \infty$.

11. $f(x) = \frac{1}{x}$; Since there is a variable in the denominator, the domain can be any number that would not make the denominator 0, since dividing by zero is undefined. Therefore, the domain is all real numbers except $x = 0$. Another way to write it is domain = $-\infty < x < 0$ AND $0 < x < \infty$.

12. We will create a table to determine the range.

x (domain)	Work shown	y (range)
–2	$x^2 - 5 = (-2)^2 - 5 = 4 - 5 = -1$	–1
–1	$x^2 - 5 = (-1)^2 - 5 = 1 - 5 = -4$	–4
0	$x^2 - 5 = (0)^2 - 5 = 0 - 5 = -5$	–5
1	$x^2 - 5 = (1)^2 - 5 = 1 - 5 = -4$	–4
2	$x^2 - 5 = (2)^2 - 5 = 4 - 5 = -1$	–1

13. We will create a table to determine the range.

x (domain)	Work shown	y (range)
–2.5	$2x - \frac{3}{4} = 2(-2.5) - \frac{3}{4} = -5 - \frac{3}{4} = -5\frac{3}{4}$ OR $-\frac{23}{4}$	$-\frac{23}{4}$
1.5	$2x - \frac{3}{4} = 2(1.5) - \frac{3}{4} = 3 - \frac{3}{4} = 2\frac{1}{4}$ OR $\frac{9}{4}$	$\frac{9}{4}$
5	$2x - \frac{3}{4} = 2(5) - \frac{3}{4} = 10 - \frac{3}{4} = 9\frac{1}{4}$ OR $\frac{37}{4}$	$\frac{37}{4}$

14. Let h = the number of hours worked

x (domain)	Work shown (6.50h)	y (range)
5	6.50(5) = 32.50	$32.50
10	6.50(10) = 65.00	$65.00
15	6.50(15) = 97.50	$97.50
20	6.50(20) = 130.00	$130.00
25	6.50(25) = 162.50	$162.50
30	6.50(30) = 195.00	$195.00

15.

h (height)	Work shown ($\frac{1}{2}8b$)	A (area)
1	$\frac{1}{2}8(1) = 4$	4 cm^2
2	$\frac{1}{2}8(2) = 8$	8 cm^2
3	$\frac{1}{2}8(3) = 12$	12 cm^2
4	$\frac{1}{2}8(4) = 16$	16 cm^2
5	$\frac{1}{2}8(5) = 20$	20 cm^2
6	$\frac{1}{2}8(6) = 24$	24 cm^2

16.

x (domain)	Work shown ($\sqrt{2x+3}$)	$f(x)$ (range)
–1	$\sqrt{2x+3} = \sqrt{2(-1)+3} = \sqrt{-2+3} = \sqrt{1} = \pm 1$	±1
0	$\sqrt{2x+3} = \sqrt{2(0)+3} = \sqrt{0+3} = \pm\sqrt{3}$	$\pm\sqrt{3}$
1	$\sqrt{2x+3} = \sqrt{2(1)+3} = \sqrt{2+3} = \pm\sqrt{5}$	$\pm\sqrt{5}$
2	$\sqrt{2x+3} = \sqrt{2(2)+3} = \sqrt{4+3} = \pm\sqrt{7}$	$\pm\sqrt{7}$
3	$\sqrt{2x+3} = \sqrt{2(3)+3} = \sqrt{6+3} = \sqrt{9} = \pm 3$	±3
4	$\sqrt{2x+3} = \sqrt{2(4)+3} = \sqrt{8+3} = \pm\sqrt{11}$	$\pm\sqrt{11}$
5	$\sqrt{2x+3} = \sqrt{2(5)+3} = \sqrt{10+3} = \pm\sqrt{13}$	$\pm\sqrt{13}$

17. The rule is $y = f(x) = x^2$.

18. Let h = the number of hours and c = the cost. Then the function is $c = 15 + 5h$.

19. The function rule is $y = \frac{24}{2x}$.

20. Let c = the number of cuts. Then, to cut a ribbon into x pieces, the function is $f(c) = cx$.

21. Let c = total charge and let h = the number of hours worked. Since the charge is a function of the hours, $c = f(h)$.
The function then becomes $f(h) = 25h + 40$.
To find out what Solomon earns for 3 hours, we want $f(3) = 25(3) + 40 = 75 + 40 = 115$.

22. Let b = the number of bracelets. Then $2500 = 12.50b$. So we need to solve for b.
$\frac{2500}{12.50} = \frac{12.50b}{12.50}$
$b = 200$
She must sell 200 bracelets to break even.

23. There are many possible solutions. One scenario is an airplane flying. The plane can travel to the left or right as much as it wants, but cannot reach zero (while flying), or else it would crash.

24. $23 > 21.999$

25. the quotient of 96 and 4 is g = $\frac{96}{4} = g$

26. 11 minus b is at least 77 = $11 - b \geq 77$

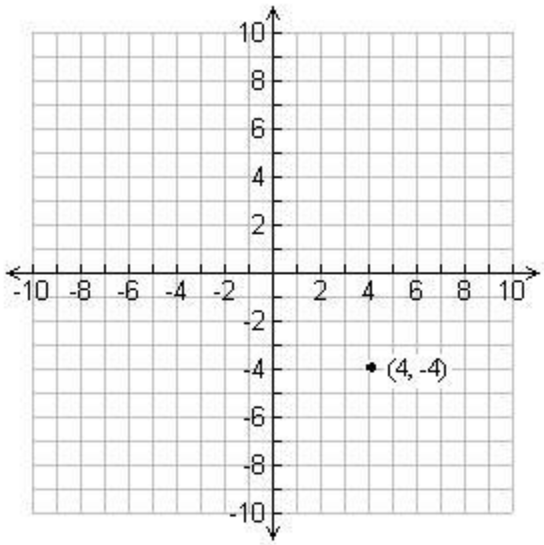
27. $\frac{13(k)}{13} = \frac{169}{13}$
$k = 13$

Quiz

1. Let n = the number of books and c = the cost. The function rule is $c = 4.75 + 0.25(n - 1)$.
2. $84 \div [(18 - 16) \times 3] = 84 \div [2 \times 3] = 84 \div 6 = 14$
3. $\frac{2}{3}(y + 6)$ when $y = 3$
$\frac{2}{3}(3+6) = \frac{2}{3}(9) = 6$
4. $y = \frac{1}{4}x^2$ becomes $f(x) = \frac{1}{4}x^2$
5. Let t = total cost
The $t = 29.99(6) + 22.99(3) = 179.94 + 68.97 = \$248.91$

Lesson 1.6 Practice Set

1.



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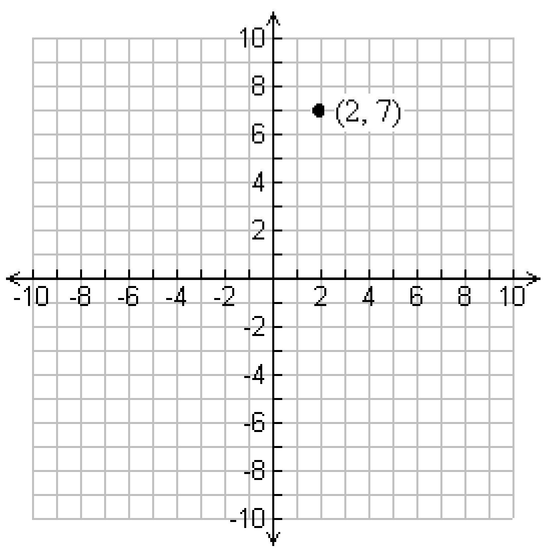

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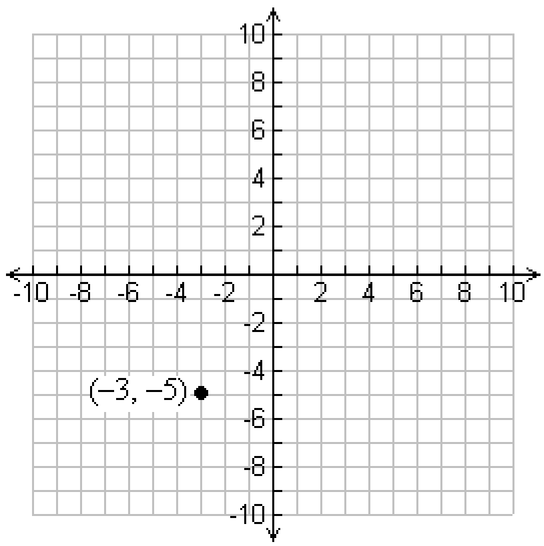
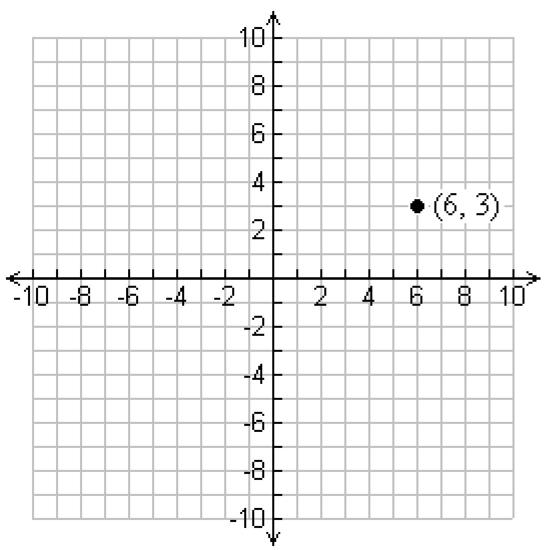
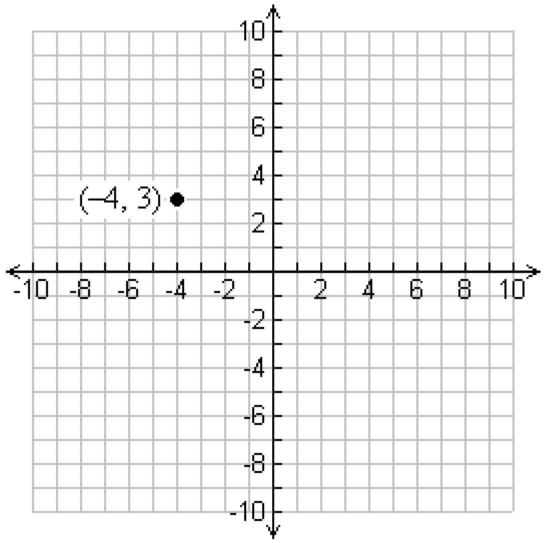


4.

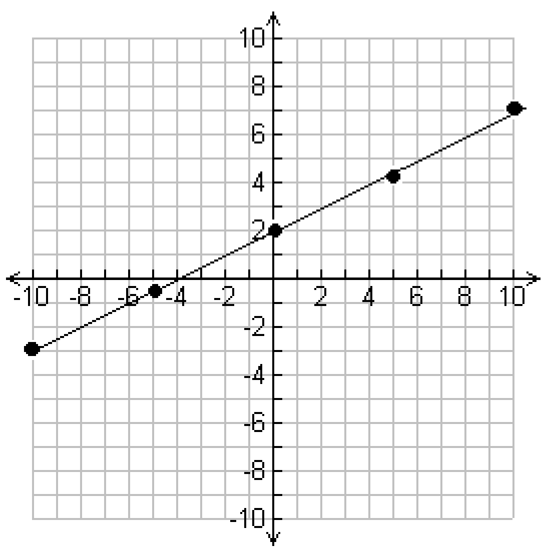


5.

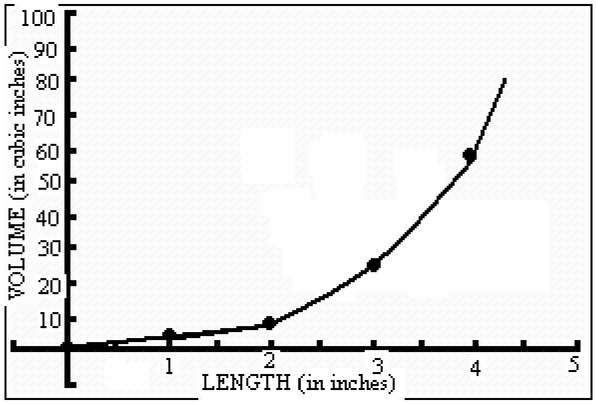


6. *a* (–6, 4)
b (7, 6)
c (–8, –2)
d (4, –7)
e (5, 0)

7.

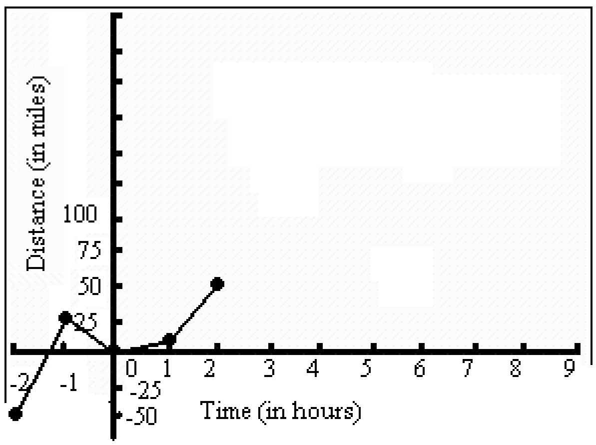


8.



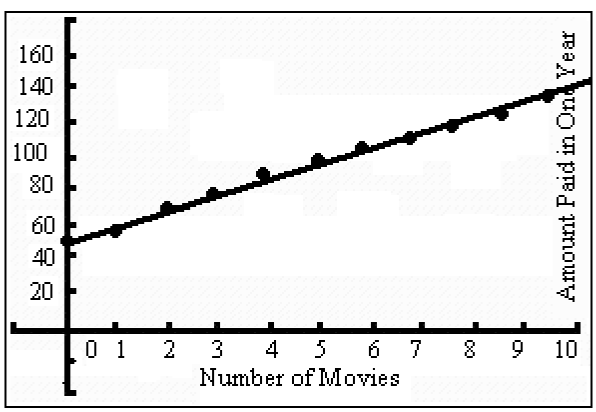
VOLUME (in cubic inches)
100
90
80
70
60
50
40
30
20
10
1
2
3
4
5
LENGTH (in inches)

9.



Distance (in miles)
100
75
50
25
-2
-1
0
1
2
3
4
5
6
7
8
9
-25
-50
Time (in hours)

10.

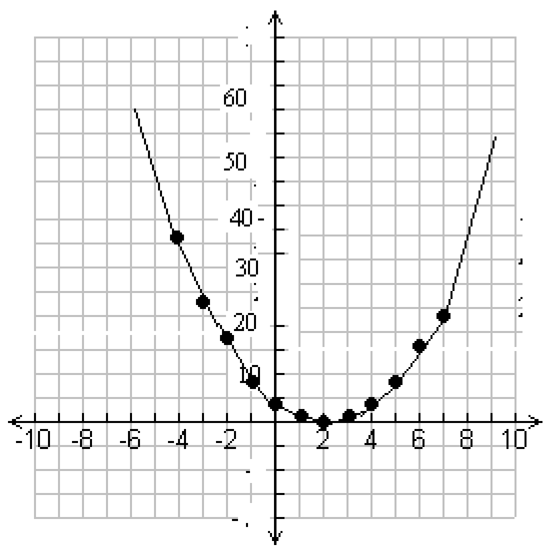


160
140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
Number of Movies
Amount Paid in One Year

11. Create a table of values to see what the function is doing.

x	$y = (x - 2)^2$	*y*
–4	$(-4 - 2)^2 = 36$	36
–3	$(-3 - 2)^2 = 25$	25
–2	$(-2 - 2)^2 = 16$	16
–1	$(-1 - 2)^2 = 9$	9
0	$(0 - 2)^2 = 4$	4
1	$(1 - 2)^2 = 1$	1
2	$(2 - 2)^2 = 0$	0
3	$(3 - 2)^2 = 1$	1
4	$(4 - 2)^2 = 4$	4
5	$(5 - 2)^2 = 9$	9
6	$(6 - 2)^2 = 16$	16
7	$(7 - 2)^2 = 25$	25

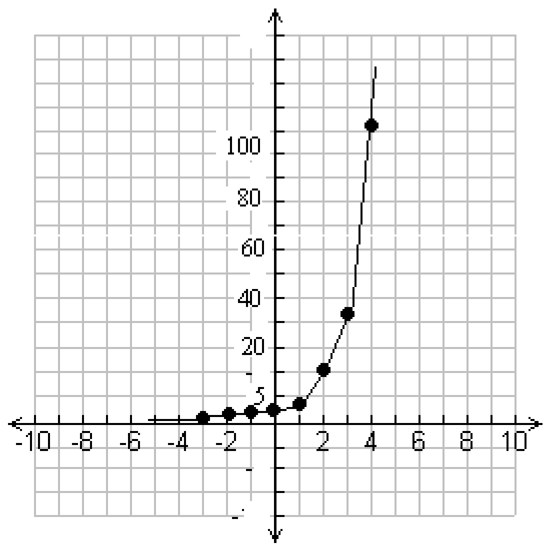
Now we can graph the function based on the table.



12. Create a table to see what the function is doing.

x	$y = 3.2^x$	y (approximate)
-3	3.2^{-3}	0.0305
-2	3.2^{-2}	0.0977
-1	3.2^{-1}	0.3125
0	3.2^{0}	1
1	3.2^{1}	3.2
2	3.2^{2}	10.24
3	3.2^{3}	32.77
4	3.2^{4}	104.86

Now we can plot the points and connect with a smooth curve.



13. Since every x-coordinate has only one y-coordinate, it is a function.

14. Since each x-coordinate has two y-coordinates, it is not a function.

15. Since age 25 has two jobs (4 and 7), it is not a function.

16. Since every x-coordinate has only one y-coordinate, it is a function.

17. The rule for the graphed relation is $y = x^2$.

18. The rule for the graphed relation is $y = \sqrt{x}$.

19. 1. 27%, 2. 35.5%, 3. 22.5%, 4. 23%

20. 1. 63 years, 2. 69 years, 3. 74 years, 4. 76 years

21. 1. \$19,000, 2. \$56,000, 3. \$10,000, 4. \$11,000, 5. \$36,000

22. Since the graph passes the Vertical Line Test, it is a function.

23. Since the graph does not pass the Vertical Line Test, it is not a function.

24. Let m = money taken in. Then the amount is $m = 12(1296) = \$15{,}552$.

25. Since there is still $\frac{2}{3}$ of the students in the room, that means that the 25 that left account for $\frac{1}{3}$ of the total. Then you can set up an equation by asking: 25 is $\frac{1}{3}$ of what number? Let x represent the total number of students.

$25 = \frac{1}{3}x$

$x = 25(3) = 75$ students

26. $\frac{x^2+9}{y+2}$ when $y = 3$ and $x = 4$

$$\frac{x^2+9}{y+2} = \frac{(4)^2+9}{(3)+2} = \frac{16+9}{3+2} = \frac{25}{5} = 5$$

27. Since $r = 7$ inches, then $A = 4\pi r^2 = 4\pi(7)^2 = 4\pi(49) = 196\pi \approx 615.75 \text{ in}^2$.

Lesson 1.7 Practice Set

1. Step 1: Understand the problem.
   Step 2: Devise a plan – Translate. Come up with a way to solve the problem. Set up an equation, draw a diagram, make a chart or construct a table as a start to begin your problem-solving plan.
   Step 3: Carry out the plan – Solve.
   Step 4: Check and Interpret: Check to see if you have used all your information. Then look to see if the answer makes sense.

2. • Drawing a diagram.
   • Making a table.
   • Looking for a pattern.
   • Using guess and check.
   • Working backwards.
   • Using a formula.
   • Reading and making graphs.
   • Writing equations.
   • Using linear models.
   • Using dimensional analysis.
   • Using the right type of function for the situation.

3. There are many possible answers. Drawing a diagram and looking for patterns are good strategies for most problems. Also, making a table and drawing a graph are often used together. The "writing an equation" strategy is the one you will work with the most frequently in your study of algebra. These combinations work well together because the pairs use the strengths of those strategies, while lessening the weaknesses of each.

4. **[Note: this item needs to refer to Example 2.]**
   36 hours to harvest
   How many ears per hour will they harvest?
   The field has 660 rows with 300 ears per row, which is 660(300) = 198,000 ears to harvest.
   Since it will take them 36 hours to harvest, the number of ears per hour =
   $\frac{\text{number of ears}}{\text{number of hours}} = \frac{198,000}{36} = 5,500$ ears per hour.

5. It is difficult to create a diagram for an algebraic scenario.

6. To check a solution, substitute the possible solution into the original equation and simplify to see of the solution creates a true statement. The purpose is the make sure the solution you found makes sense.

7. Let w = the number of women and m = the number of men. Then $w + m = 12$. Since there were 4 more women than men, we can write $m = w - 4$. We can substitute into the original equation to get
$w + (w - 4) = 12$
$2w - 4 = 12$
$2w = 16$
$w = 8$
There are 8 women on the jury.

8. The rope is 14 feet. Let l_1 = the length of the shorter piece and l_2 = length of the longer piece. Then we can write $l_1 + l_2 = 14$. We also know that the longer piece, l_2, is $l_1 + 2.25$
So, $l_1 + l_2 = 14$ becomes
$l_1 + (l_1 + 2.25) = 14$
$2(l_1) + 2.25 = 14$
$2(l_1) = 11.75$
$l_1 = 5.875$ feet
By substituting this value into the original equation, we get
$l_1 + l_2 = 14$
$5.875 + l_2 = 14$
$l_2 = 8.125$

9. The total price = the purchase price + amount of sales tax
The sales percent needs to be converted to a decimal, so 7.75% becomes 0.0775.
Then the total price can be calculated by the purchase price times 1.0775.
Let c = the total price
$c = 35(1.0775) = \$37.71$

10. Let x = the original salary. We know that the new salary = 100% of the original salary + 5% more of the original salary, so 105% of the original salary = new salary.
$$\frac{1.05x}{1.05} = \frac{45{,}000}{1.05}$$
$x = 42857.14$
The original salary was $42,857.14.

11. We can find the area of the two rooms. Let r_1 = area of the larger room and r_2 = area of the smaller room
Then $r_1 = 14(18) = 252$ sq. feet and $r_2 = 9(10) = 90$ sq. feet.
The ratio of cost per sq foot = $\frac{250}{252} \approx 0.99$. It costs approximately $0.99/sq foot.
To find the cost for the other room, we multiply: 90(0.99) = 89.10. It will cost approximately $89.10 to carpet the smaller room.

12. Let c = the final cost of the purse.
    We know the discount is for 15%, so the employee is paying 100% - 15% = 85% of the original price.
    The final cost can be found by multiplying the original cost ($65) by the discount percent written as a decimal (0.85), then subtracting the $10 coupon.
    So $c = 65(0.85) – 10 = 55.25 – 10 = \$45.25$. The final purchase price is $45.25.

13. Let p = the total price. $p = 250 + 20(25) = 250 + 500 = \$750$.
    The total price for the dance is $750.

14. The total is $24.00. Let r = the number of rides. So, $24 = 12 + 1.5r$.
    $24 = 12 + 1.5r$
    $–12 \quad –12$
    $\frac{12}{1.5} = \frac{1.5r}{1.5}$
    $r = 8$
    The number of rides Rena rode is 8.

15. Let m = the money earned on Saturday
    Then $m = 2.92(22) + 3.50(26) + 4.5(15) = 64.24 + 91.00 + 67.50 = 222.74$
    The ice cream shop earned $222.74 on Saturday.

16. Let x = the size of the smallest angle. Then we know that $x + 2x + 3x = 180$. So,
    $\frac{6x}{6} = \frac{180}{6}$
    $x = 30^{\circ}$

17. *It takes Lily 45 minutes to bathe and groom a dog. How many dogs can she groom in an 9-hour day?*
    The variable should represent the number of dogs. Let d = the number of dogs.

18. *Fourteen less than twice a number is greater than or equal to 16.*
    $2x – 14 \geq 16$

19. The pattern is to multiply every x by 4 to get the corresponding y value. See the table below.

x	$y = 4x$	y
–2	4(–2) = –8	–8
–1	4(–1) = –4	–4
0	4(0) = 0	0
1	4(1) = 4	4

20. $3(4) - 11 > -3$
$12 - 11 > -3$
$1 > -3$ ✓

21. domain = [1991, 2005] OR $1991 \leq$ year ≤ 2005
range = [22, 36.5] OR $22 \leq$ percentage ≤ 36.5

Lesson 1.8 Practice Set

1. The base value is 10 minutes/day. Then, Josie adds 2 minutes/week, so if we let w = the number of weeks, we can calculate the minutes for any number of weeks.
   $10 + 2w$ when $w = 6$
   $10 + 2(6) = 10 + 12 = 22$ minutes in week six

2. Let n = the number of nickels and d = the number of dimes.
   We know that $n + d = 40$. We also know that $0.05n + 0.10d = 2.25$.
   We can solve the first equation for n: $n = 40 – d$.
   Next, substitute that value $(40 – d)$ into the second equation for n.
   $0.05n + 0.10d = 2.25$ becomes $0.05(40 – d) + 0.10d = 2.25$
   Now we can solve for d.
   $0.05(40 – d) + 0.10d = 2.25$
   $2 – 0.05d + 0.10d = 2.25$
   $2 + 0.05d = 2.25$
   $–2 \quad\quad –2$
   $\frac{0.05d}{0.05} = \frac{0.25}{0.05}$
   $d = 5$
   Now, since there are 5 dimes, we can find the number of nickels by substituting that value into either of equation.
   $n + 5 = 40$
   $n = 35$
   There are 35 nickels and 5 dimes.

3. The first 3 figures have the first three odd whole numbers: 1, 3, 5…. If we continue that concept, the 12^{th} odd whole number will be 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23.
   The 12^{th} figure will have 23 squares in it.
   To calculate this algebraically, we can find the nth odd number by using this formula: $2n – 1$ where n is the number of the figure. Therefore the 12^{th} figure will have $2(12) – 1 = 24 – 1 = 23$ squares.

4. He is reducing the number of cups by 3 cups per week. Therefore, if w = the number of cups, then we can determine how many cups he is drinking by the expression $24 – 3w$. Since we want to know when he will be at 6 cups, we need to solve for w.

   $24 – 3w = 6$
   $–24 \quad\quad –24$
   $\frac{–3w}{–3} = \frac{–18}{–3}$
   $w = 6$
   It will take 6 weeks for Oswald to reduce the number of coffee cups to 6.

5. total fine = the number of days x the amount per day = 5(0.10) = $0.50

6. We will use the formula $d = rt$ (distance = rate x time). The formula for the car 1 will be $d_1 = r_1t_1$ and the formula for the car 2 will be $d_2 = r_2t_2$.
Since we are determining that one car is catching up to the other car, we can say that $d_1 = d_2$.
Because of that, we also know that $r_1t_1 = r_2t_2$.
We know that $r_1 = 75$ and $r_2 = 55$. Finally, if we let the time of the car 1 to be t_1, then we know that $t_2 = t_1 + 2$ (Car 2 is traveling 2 hours more).
By substitution, $75t_1 = 55(t_1 + 2)$. We can solve for the time of the car 1 (the amount of time it will take to catch car 2).
$75t_1 = 55(t_1 + 2)$
$75t_1 = 55t_1 + 110$
$20t_1 = 110$
$t_1 = 5.5$
It will take the car 1 5.5 hours to catch car 2.

7. This item will be very similar to item 6. We will again use $d_1 = r_1t_1$ for Grace and the formula for the Dan will be $d_2 = r_2t_2$. Again, since we are determining that Dan is catching up to the Grace, we can say that $d_1 = d_2$.
Because of that, we also know that $r_1t_1 = r_2t_2$.
For Grace, $r_1 = 12$ and for Dan, $r_2 = 15$. Dan is traveling for 1 hour less than Grace, so $t_2 = t_1 - 1$
Using substitution, $12t_1 = 15(t_1 - 1)$.
Solve for t_1.
$12t_1 = 15(t_1 - 1)$
$12t_1 = 15t_1 - 15$
$-12t_1 \quad -12t_1$
$0 = 3t_1 - 15$
$+15 \quad\quad +15$
$\frac{15}{3} = \frac{3t_1}{3}$
$5 = t_1$
Grace is traveling for 5 hours; therefore, Dan is traveling 5 – 1 = 4 hours.

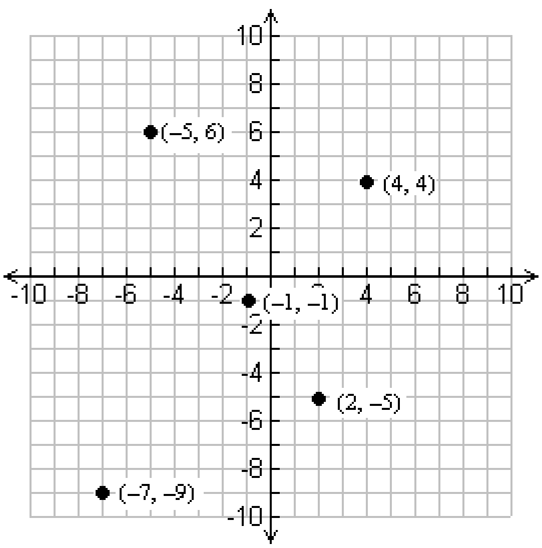
8. The largest possible area can be found using a circle. So, we need to find the area of a circle with a circumference of 24 feet. To do this, we need to find the radius of the circle.
The formula for the circumference of a circle is $C = 2\pi r$ where r is the radius.
So, $24 = 2\pi r$
$r = \frac{24}{2\pi} \approx 3.82$ feet
The formula for finding the area of a circle is $A = \pi r^2$.
So $A = \pi r^2 \approx \pi(3.82)^2 \approx 45.84$ square feet.

9. This is a function since all of the values in the domain map to exactly one item in the range.

10.

j	Work Shown	m
0	78(0) = 0	0
1	78(1) = 78	78
2	78(2) = 156	156
3	78(3) = 234	234
4	78(4) = 312	312
n	$78(n) = 78n$	$78n$

11.



12. $-4(4z - x + 5)$ when $x = -10$ and $z = -8$
$-4(4(-8) - (-10) + 5) = -4(-32 + 10 + 5) = -4(-17) = 68$

13. $A = \pi r^2 = \pi(6)^2 = 36\pi \approx 113.10 \text{ mm}^2$

14. Louie spent 9(1.19) = \$10.71

15. $16 \times \frac{1}{8}c = \frac{16}{8}c = 2c$

Lesson 1.9 Chapter Review

1. domain – The set of all possible input values for the independent variable (p. 21)

2. range – The values resulting from the substitution of the domain (p. 21)

3. solution – The **solution** to an equation or inequality is the value (or multiple values) that make the equation or inequality true. (p. 15)

4. evaluate – To **evaluate** means to follow the verbs in the math sentence. **Evaluate** can also be called simplify or answer. (p. 2)

5. substitute – To **substitute** means to replace the variable in the sentence with a value. (p. 2)

6. operation – A math verb is called an **operation.** Operations can be something you have used before, such as addition, multiplication, subtraction or division or be more complex like an exponent or square root (p. 1 – 2)

7. variable – A variable is a symbol, usually an English letter, written to replace an unknown or changing quantity. (p. 2)

8. algebraic expression – An **algebraic expression** is a mathematical phrase combining numbers and/or variables using mathematical operations. (p. 11)

9. equation – When an algebraic expression is set equal to another value, variable, or expression, a new mathematical sentence is created. (p. 14)

10. algebraic inequality – An **algebraic inequality** is a mathematical sentence connecting an expression to a value, variable, or another expression with an inequality sign. (p. 16)

11. function – A **function** is a relationship between two variables such that the input value has ONLY one output value. (p. 20)

12. independent variable – a table of values can be created by choosing values to represent the **independent variable. (p. 21)**

13. $3y(7-(z-y))$ when $y=-7$ and $z=2$
    $3(-7)(7-(2-(-7)))=-21(7-9)=-21(-2)=42$

14. $\frac{m+3n-p}{4}$ when $m=9$, $n=7$, and $p=2$
    $$\frac{m+3n-p}{4}=\frac{9+3(7)-2}{4}=\frac{28}{2}=14$$

15. $|p|-\left(\frac{n}{2}\right)^3$ when $n = 2$ and $p = 3$

$|3|-\left(\frac{2}{2}\right)^3 = 3-1^3 = 3-1 = 2$

16. $|v - 21|$ when $v = -70$
$|-70 - 21| = |-91| = 91$

17. let c = the number of candies

18. let t = the number of tomatoes

19. let c = the number of cats

20. let s = the amount of snow

21. let w = the number of water skiers

22. let g = the number of geese

23. let p = the number of people

24. $A = 4\pi r^2 = 4\pi(10)^2 = 4\pi(100) = 400\pi \approx 1,256.64 \text{ in}^2$

25. $A = 4\pi r^2 = 4\pi(2.4)^2 = 4\pi(5.76) = 23.04\pi \approx 72.38 \text{ cm}^2$

26. The diameter is 19 m, so the radius is 9.5 m.
$A = 4\pi r^2 = 4\pi(9.5)^2 = 4\pi(90.25) = 361\pi \approx 1134.11 \text{ m}^2$

27. $A = 4\pi r^2 = 4\pi(0.98)^2 = 4\pi(0.9604) = 3.8416\pi \approx 12.07 \text{ mm}^2$

28. The diameter is 5.5 inches, so the radius is 2.75 inches.
$A = 4\pi r^2 = 4\pi(2.75)^2 = 4\pi(7.5625) = 30.25\pi \approx 95.03 \text{ in}^2$

29. $1 + (2 \cdot 3) + 4 = 15$ Parentheses are not needed, since the order of operations require one to multiply before adding.

30. $5 \cdot (3 - 2 + 6) = 35$

31. $(3 + 1) \cdot (7 - 2^2) \cdot (9 - 7) = 24$

32. $(4 + 6) \cdot 2 \cdot (5 - 3) = 40$

33. $(3^2 + 2) \cdot (7 - 4) = 33$

34. Thirty-seven more than a number is 612 → x + 37 = 612

34. The product of *u* and –7 equals 343 → $-7u = 343$

36. The quotient of *k* and 18 → k ÷ 18 OR $\frac{k}{8}$

37. Eleven less than a number is 43 → $x - 11 = 43$

38. A number divided by –9 is –78 → a ÷ –9 = –78 OR $\frac{a}{-9} = -78$

39. The difference between 8 and *h* is 25 → $8 - h = 25$

40. The product of 8 –2, and *r* → $(8 - 2)r$

41. Four plus *m* is less than or equal to 19 → $4 + m \leq 19$

42. Six is less than *c* → c – 6

43. Forty-two less than *y* is greater than 57 → $y - 42 > 57$

44. Let *m* = the number of movies watched and let *t* = the total time

45. A half-dozen is 6. Let *d* = then number of donuts. Then *d* = 168(6) = 1,008 donuts

46. Let *m* = the number of mowing jobs and *l* = the number of landscaping jobs. Then $10m + 35l \geq 8600$.

47. $t = 0.9$, $54 \leq 7(9t + 5)$
    $54 \leq 7(9(0.9) + 5)$
    $54 \leq 7(8.1 + 5)$
    $54 \leq 7(8.6)$
    $54 \leq 60.2$ ✔

48. $f = 2$; $f + 2 + 5f = 14$
    $2 + 2 + 5(2) = 14$
    $4 + 10 = 14$
    $14 = 14$ ✔

49. $p = -6$; $4p - 5p \leq 5$

$4(-6) - 5(-6) \leq 5$

$-24 - (-30) \leq 5$

$-24 + 30 \leq 5$

$6 \leq 5$ ✘

50. Let m = the number of text messages and c = the cost. Then $c = 18 + 0.05m$.

51. Let m = the number of months and c = the cost. Then $c = 14.99m$.

52. domain - $-\infty < x < \infty$ (All real numbers)

range – $0 \leq y < \infty$

53. Let v = the number of vending machines. Then

$$\frac{128v}{128} = \frac{5100}{128}$$

$v = 39.84$

Henry needs to install 40 machines to break even.

54. Yes, this is a function since it passes the vertical line test.

55. Let p = the number of games the Pelicans won and r = the number of games the Raccoons won. Then we know that $p + r = 38$. Since $r = 13$, then we can substitute that value. Therefore, $p + 13 = 38$ and $p = 38 - 13 = 25$. The Pelicans won 25 games.

56. Let e = the number of people in Elmwood and m = the number of people in Maplewood. Then we can write $e + 250 = m$ and $e = 900$. So, by substitution, $900 + 250 = 1150 = m$.

57. Let x = the number of minutes in the Bonus Plan and y = the number of minutes in the Basic Plan. Then we know that $x = 4y$. We can substitute since x = 1200 to get

$$\frac{1200}{4} = \frac{4y}{4}$$

$300 = y$

The Basic Plan gives one 300 minutes.

58. Let t = the total number of minutes exercised. Then $t = 24(7) = 168$ hours.

59. Let t = the cost of tickets at the mall theater. Then we know that the tickets at the downtown theater is
$t - 1.50 = 8$
$+1.50 \qquad + 1.50$
$t = 9.50$
The tickets at the mall theater costs $9.50.

60. Let f = the number of feet for every-day tape. Then $f - 75 = 225$. So $f = 225 - 75 = 150$ feet.

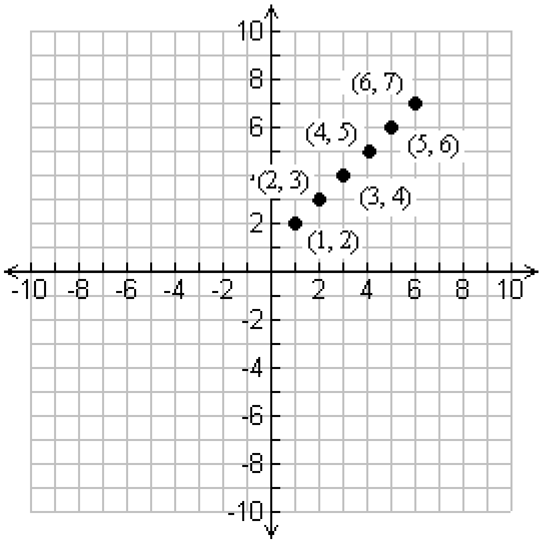
61. Let s = the number of strikes Junior got. Then
$\frac{28}{3.5} = \frac{3.5s}{3.5}$.
$s = 8$.
Junior got 8 strikes.

Lesson 1.10 Chapter Test

1. Let p = the price on Tuesday. Then $p + 59 = 255$. Solving for $p = 255 - 59 = 196$. The stock price on Tuesday was 196.

2. Let k = the height of the oak and m = the height of the maple. Then $k = m + 40$.

3.



4. domain $-5 \leq x \leq 9$; range $8 \leq y \leq 25$

5. No, this is not a function because the 3 in the domain is mapped to two different values in the range.

6. $(5bc) - a$ when $a = 2$, $b = 3$, $c = 4$
$5(3)(4) - 2 = 58$

7. $3[36 \div (3 + 6)] = 3(36 \div 9) = 3(4) = 12$

8. Let p = the price of the pizza
$$\frac{1}{8}p = 1.09$$
$p = 1.09(8) = 8.72$
The pizza costs $8.72.

9. Let g = the number of girls. Then the number of boys is $g - 17$. We know that the number of girls + the number of boys = 561. So,
$g + (g - 17) = 561$
$2g - 17 = 561$
$2g = 578$
$g = 289$
There are 289 girls.

10. The <u>quotient</u> of 8 and y is 48.

11. Use $b = 16h$, where b = the number of boxes and h = the number of hours

Hours	0	2	4	5	8	10	12	14
Boxes	0	32	64	80	128	160	192	234

12. We need to know "18 is $\frac{1}{8}$ of what number?" If we translate, we get the following equation:
$$18 = \frac{1}{8}x$$
To solve for x, we will multiply both sides of the equation by $\frac{8}{1}$.
$$\left(\frac{8}{1}\right)18 = \frac{1}{8}x\left(\frac{8}{1}\right)$$
$x = 144$
Therefore, there were 144 students in the class.

13. {(2, 3), (4, 5), (6, 7), (−2, −3), (−3, −4)}
domain – {−2, −3, 2, 4, 6} range – {−3, −4, 3, 5, 7}

14. The rule is $y = 60x$. For every x, multiply by 60 to get y.

15. Determine if y = 6 is a solution of $\frac{6-y}{y} > -8$.
$$\frac{6-6}{6} > -8$$
$$\frac{0}{6} > -8$$
$$0 > -8$$
Therefore, $y = 6$ is a solution of the inequality.