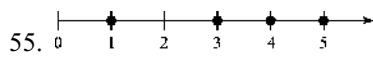


## Chapter 1 Whole Numbers

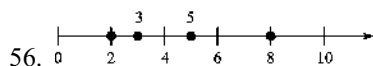
### Section 1.1 Introduction to Whole Numbers

1. counting
2. 0
3. periods
4. standard
5. place value
6. trillions
7. word
8. expanded
9. graph
10. bar graph, line graph
11. The digit 8 is the fourth digit from the right. It is in the thousands place.
12. The digit 8 is the second digit from the right. It is in the tens place.
13. The digit 8 is the eighth digit from the right. It is in the ten-millions place.
14. The digit 8 is the sixth digit from the right. It is in the hundred-thousands place.
15. The digit 8 is the third digit from the right. It is in the hundreds place.
16. The digit 8 is the fifth digit from the right. It is in the ten-thousands place.
17. The digit 8 is the first digit from the right. It is in the ones place.
18. The digit 8 is the seventh digit from the right. It is in the millions place.
19. The digit 8 is the ninth digit from the right. It is in the hundred-millions place.
20. The digit 8 is the tenth digit from the right. It is in the billions place.
21. The hundreds place is the third place from the right. The digit is 7.
22. The ten-thousands place is the fifth place from the right. The digit is 1.
23. The hundred-thousands place is the sixth place from the right. The digit is 8.
24. The ones place is the first place from the right. The digit is 5.
25. The billions place is the tenth place from the right. The digit is the 3.
26. The millions place is the seventh place from the right. The digit is 9.
27. The tens place is the second place from the right. The digit is 2.
28. The thousands place is the fourth place from the right. The digit is 6.
29. The hundred-millions place is the ninth place from the right. The digit is 4.
30. The ten-millions place is the eighth place from the right. The digit is 0.
31. In word form, the number 472,500 is written as four hundred seventy-two thousand, five hundred.
32. In word form, the number 79 is written as seventy-nine.
33. In word form, the number 93,206 is written as ninety-three thousand, two hundred six.
34. In word form, the number 10,000,015 can be written as ten-million, fifteen.

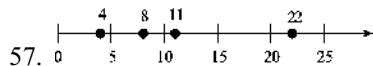
35. In word form, the number 1651 can be written as one thousand, six hundred fifty one.
36. In word form, the number 632 can be written as six hundred thirty two.
37. Two thousand fifty-five is written in standard form as 2055.
38. Four hundred seventy-one is written in standard form as 471.
39. Five hundred ninety-nine million, six hundred sixteen thousand, four hundred twenty three can be written as 599,616,423.
40. Four thousand, one hundred thirty-five miles can be written as 4135.
41. Thirty-nine million, four hundred ten thousand can be written in standard form as 39,410,000.
42. Fifty-two thousand, three hundred sixty-seven can be written in standard form as 52,367.
43. Eighty-three billion, six hundred thousand, twelve can be written in standard form as 83,000,600,012.
44. One million, four hundred two thousand, eighty-one can be written in standard form as 1,402,081.
45.  $300,000+40,000+2000+500+60+3$  can be written in standard form as 342,563.
46.  $5000+500+50+1$  can be written in standard form as 5551.
47.  $7,000,000+900,000+5000+300+70+7$  can be written in standard form as 7,905,377.
48.  $4,000,000+500,000+7000+200+9$  can be written in standard form as 4,507,209.
49. In expanded form, 2,510,036 is written as  $2,000,000+500,000+10,000+30+6$
50. In expanded form, 8004 is written as  $8000+4$ .
51. In expanded form, 629 is written as  $600+20+9$ .
52. In expanded form, 63,907 is written as  $60,000+3000+900+7$ .
53. In expanded form, 603,138 is written as  $600,000+3000+100+30+8$
54. In expanded form, 17 is written as  $10+7$ .



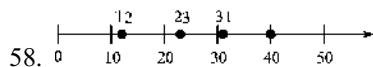
- a)  $3 < 5$       b)  $4 > 3$       c)  $5 > 1$



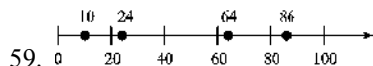
- a)  $3 > 2$       b)  $5 < 8$       c)  $2 < 5$



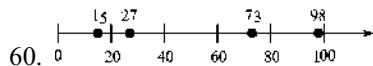
- a)  $22 > 4$       b)  $8 < 11$       c)  $11 < 22$



- a)  $12 < 31$       b)  $23 < 40$       c)  $31 < 40$



- a)  $86 > 64$       b)  $64 > 24$       c)  $24 > 10$



- a)  $27 < 73$       b)  $98 > 15$       c)  $15 < 73$

61.  $34 > 0$ , since 34 is to the right of 0.
62.  $0 < 56$ , since 0 is to the left of 56.
63.  $45 < 54$ , since 45 is to the left of 54.
64.  $72 > 27$ , since 72 is to the right of 27.
65.  $300 > 299$ , since 300 is to the right of 299.
66.  $175 > 155$ , since 175 is to the right of 155.
67.  $30,000 < 300,000$ , since 30,000 is to the left of 300,000.
68.  $2100 > 2001$ , since 2100 is to the right of 2001.
69.  $50,101 < 51,010$ , since 50,101 is to the left of 51,010.
70.  $630,020 < 632,202$ , since 630,020 is to the left of 632,202.
71. According to the graph India had 81,000,000 Internet users in 2012.
72. According to the graph, there were 101,000,000 Internet users in Japan in 2012.
73. According to the graph, France had the fewest Internet users in 2012.
74. According to the graph, Brazil had more Internet users in 2012 than Russia.
75. According to the graph, the longest river in Canada is the Mackenzie.
76. According to the graph, the St. Lawrence River is the 3058 kilometers long.
77. According to the graph, the Nelson River is 2575 km long.
78. According to the graph, the Yukon River is longer than the Nelson River.
79. According to the graph, in 2014 Guardians of the Galaxy took in the smallest amount in box office receipts.
80. According to the graph, The Avengers had box office receipts of \$623,000,000.
81. According to the graph, in 2014 Guardian of the Galaxy had box office receipts of \$315,000,000.
82. According to the graph, The Hunger Games had higher gross box office receipts than Toy Story 3.
83. According to the graph, the minimum wage has increased over the time period.
84. According to the graph, the minimum wage in 1990 was 380 cents or \$3.80.
85. According to the graph, the largest increase occurred from 1990 to 2010.
86. According to the graph, in 1950 the minimum wage was 75 cents.
87. According to the chart, Web Site Design had the highest score.
88. According to the chart, product pricing had a satisfaction score of 7.
89. Since each line in the chart represents a multiple of 2, then the web security score is 4.
90. According to the chart, people are not satisfied with shipping costs.
91. According to the charts, the Power Tools site had a higher score than the Electronics site.
92. According to the chart, Web Site Design had a score of 3.
93. According to the charts, the Power Tool site had an overall score of 38 and the Electronics site had a score of 37.
94. According to the chart, people are satisfied with the security of the site.
95. According to the table, in 2006 females had an average score of 502.

96. According to the table, in 2004 males earned the highest average score.
97. According to the table, in 2008 males had a higher average score than females.
98. According to the table, in 2008 and 2010 males recorded an identical average score.
99. According to the table, in 2010 public colleges cost \$8174.
100. According to the table, in 2012 private colleges cost \$25,593.
101. According to the table, in 2011 public colleges had a cost of \$8557.
102. According to the table, the cost of public and private colleges never decreased from one year to the next.
103. In expanded form 1124 can be written as  $1000+100+20+4$ .
104. In expanded form 186,282 can be written as  $100,000+80,000+6000+200+80+2$ .
105. Thirty-four billion, three hundred fifty-nine million, seven hundred thirty-eight thousand, three hundred seventy-eight can be written in standard form as 34,359,738,378.
106. One billion, seventy-three million, seven hundred forty-one thousand, eight hundred twenty-four can be written in standard form as 1,073,741,824.
107. In word form, the number 423,000,000,000 can be written as four hundred twenty-three billion.
108. In word form, the number 98,700,000 can be written as ninety-eight million, seven hundred thousand.
109. The truck driver earns more since 41,804 is to the right of 41,627 on a number line.
110. The white dish has fewer bacteria since 12,678,453 is to the left of 12,687,435 on a number line.

### **Section 1.2 Adding and Subtracting Whole Numbers; Perimeter**

1. addends
2. sum.
3. Yes,
4. commutative
5. associative
6. identity
7. addition
8. minuend, subtrahend
9. difference
10. No
11. identity
12. subtraction
13. solution
14. solutions

15.  $11$

$+ \underline{17}$

$28$

16.  $34$

$+ \underline{21}$

$55$

17.  $534$

$+ \underline{65}$

$599$

18.  $742$

$+ \underline{56}$

$798$

19.  $624$

$+ \underline{261}$

$885$

20.  $322$

$+ \underline{516}$

$838$

21.  $7511$

$+ \underline{357}$

$7868$

22.  $2128$

$+ \underline{671}$

$2799$

23.  $1$   
 $3748$

$+ \underline{4124}$

$7872$

24.  $1$   
 $3352$

$+ \underline{1539}$

$4891$

25.  $11$   
 $16,491$

$+ \underline{10,573}$

$27,064$

$$\begin{array}{r}
 1 \ 11 \\
 12,458 \\
 26. \ +23,975 \\
 \hline
 36,433
 \end{array}$$

$$\begin{array}{r}
 1 \ 11 \\
 28,529 \\
 27. \ +53,298 \\
 \hline
 81,827
 \end{array}$$

$$\begin{array}{r}
 1 \ 111 \\
 340,982 \\
 28. \ + 72,099 \\
 \hline
 413,081
 \end{array}$$

$$\begin{array}{r}
 11 \ 1 \\
 409,377 \\
 29. \ + 654,782 \\
 \hline
 1,064,159
 \end{array}$$

$$\begin{array}{r}
 111 \ 1 \\
 500,809 \\
 30. \ + 499,765 \\
 \hline
 1,000,574
 \end{array}$$

$$\begin{array}{r}
 230 \\
 5602 \\
 31. \ + 3135 \\
 \hline
 8967
 \end{array}$$

$$\begin{array}{r}
 11 \ 2 \\
 528 \\
 32. \ 6377 \\
 \hline
 + 8327 \\
 15,232
 \end{array}$$

$$\begin{array}{r}
 1 \ 12 \\
 10,669 \\
 33. \ 45,127 \\
 \hline
 +32,255 \\
 88,051
 \end{array}$$

$$\begin{array}{r}
 12 \ 1 \\
 73,417 \\
 34. \ 56,830 \\
 \hline
 +22,804 \\
 153,051
 \end{array}$$

35. Commutative Property

36. Commutative Property

37. Identity Property

38. Identity Property

39. Associative Property

40. Associative Property

41. 66

42. 83

43. 70

44. 92

24

45.  $\underline{-11}$

13

55

46.  $\underline{-31}$

24

468

47.  $\underline{- 37}$

431

282

48.  $\underline{- 61}$

221

1769

49.  $\underline{- 347}$

1422

3857

50.  $\underline{- 554}$

3303

3672

51.  $\underline{-3521}$

151

8175

52.  $\underline{-8042}$

133

2 14

~~55~~4

53.  $\underline{-3218}$

2316

$$\begin{array}{r}
 412 \\
 64\cancel{5}\cancel{2} \\
 54. \quad -\underline{3327} \\
 3125
 \end{array}$$

$$\begin{array}{r}
 514211 \\
 5\cancel{6},\cancel{4}\cancel{3}\cancel{1} \\
 55. \quad -\underline{23,526} \\
 32,905
 \end{array}$$

$$\begin{array}{r}
 711317 \\
 8\cancel{1},\cancel{6}\cancel{4}\cancel{7} \\
 56. \quad -\underline{58,329} \\
 23,318
 \end{array}$$

$$\begin{array}{r}
 71212 \\
 45,\cancel{8}\cancel{3}\cancel{2} \\
 57. \quad -\underline{14,399} \\
 31,433
 \end{array}$$

$$\begin{array}{r}
 0171312817 \\
 1\cancel{8}\cancel{4},\cancel{2}\cancel{9}\cancel{7} \\
 58. \quad -\underline{98,428} \\
 85,869
 \end{array}$$

$$\begin{array}{r}
 416 \\
 517,0\cancel{5}\cancel{6} \\
 59. \quad -\underline{416,029} \\
 101,027
 \end{array}$$

$$\begin{array}{r}
 613610 \\
 8\cancel{7}\cancel{3},\cancel{8}\cancel{7}\cancel{0} \\
 60. \quad -\underline{649,335} \\
 224,535
 \end{array}$$

$$\begin{array}{r}
 29917 \\
 3\cancel{0}\cancel{0}\cancel{7} \\
 61. \quad -\underline{389} \\
 2618
 \end{array}$$

$$\begin{array}{r}
 59914 \\
 6\cancel{0}\cancel{0}\cancel{4} \\
 62. \quad -\underline{576} \\
 5428
 \end{array}$$



$$\begin{array}{r}
 3991513 \\
 \cancel{40}, \cancel{063} \\
 63. \quad -22,378 \\
 \hline
 17,685
 \end{array}$$

$$\begin{array}{r}
 69913 \\
 \cancel{70}, \cancel{036} \\
 64. \quad -67,873 \\
 \hline
 2163
 \end{array}$$

$$\begin{array}{r}
 09916913 \\
 \cancel{100}, \cancel{703} \\
 65. \quad -89,827 \\
 \hline
 10,876
 \end{array}$$

$$\begin{array}{r}
 39910912 \\
 \cancel{400}, \cancel{102} \\
 66. \quad -398,516 \\
 \hline
 1586
 \end{array}$$

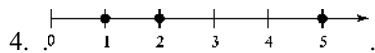
67. The corresponding mathematical expression is  $22+57$ , which results in \$79.
68. The corresponding mathematical expression is  $107-39$ , which results in 68 songs.
69. The corresponding mathematical expression is  $793-54$ , which results in 739 photos.
70. The corresponding mathematical expression is  $1011+873$ , which results in 1884 toothpicks.
71. The corresponding mathematical expression is  $62-19$ , which results in 43 eggs.
72. The corresponding mathematical expression is  $13+89+104$ , which results in 206 cell phone minutes.
73. The corresponding mathematical expression is  $1200+300$ , which results in 1500 patients.
74. The corresponding mathematical expression is  $107-89$ , which results in 18 degrees.
75. The corresponding mathematical expression is  $645-3$ , which results in 642 DVDs.
76. The corresponding mathematical expression is  $185-58$ , which results in 127 plates.
77. The corresponding mathematical expression is  $39+71$ , which results in 110 web pages.
78. The corresponding mathematical expression is  $539+267$ , which results in 806 downloads.
79. The solution is 9 because  $9-3=6$  is a true statement.
80. The solution is 4 because  $5+4=9$  is a true statement.
81. The solution is 3 because  $8-3=5$  is a true statement.
82. The solution is 3 because  $3+7=10$  is a true statement.
83. The solution is 20 because  $20+14=34$  is a true statement.
84. The solution is 10 because  $24-10=14$  is a true statement.
85. The solution is 27 because  $87-60=27$  is a true statement.
86. The solution is 89 because  $31+58=89$  is a true statement.
87. The solution is 151 because  $151-10=141$  is a true statement.
88. The solution is 47 because  $53+47=100$  is a true statement.

89. The solution is 27 because  $80+27=107$  is a true statement.
90. The solution is 72 because  $84-12=72$  is a true statement.
91. The solution is 529 because  $150+379=529$  is true statement.
92. The solution is 116 because  $116-102=14$  is a true statement.
93. The perimeter is  $13+20+23=56$  feet.
94. The perimeter is  $18+18+11+11=58$  inches.
95. The perimeter is  $5+9+3+12+6=35$  cm.
96. The perimeter is  $7+7+7+10+8=39$  miles.
97. The perimeter is  $14+13+10+7+4+6=54$  miles.
98. The perimeter is  $25+10+13+13+12+23=96$  cm.
99. The perimeter is  $8+21+18+5+10+16=78$  inches.
100. The perimeter is  $22+26+15+14+37+40=154$  feet.
101.  $16-4=12$ ; Therefore, the iPhone camera has 12 megapixels.
102.  $3+3=6$ , The screen size of the Samsung phone is 6 inches.
103.  $83-40=43$  Therefore, Gaedel's height is 43 inches.
104.  $131+32=163$  Therefore, Groth's record serve is 163 mph.
105.  $553+69=622$  deaths in 2011 and 2012.
106.  $2,400,000-1,331,500=1,068,500$ . Therefore, the difference between the largest and smallest number of fires is 1,068,500.
107.  $70+60=130$  Therefore, the iPhone 5 can withstand 130 pounds of pressure.
108.  $150-60=90$ . Therefore, the iPhone 6 can withstand 90 pounds of pressure.
109.  $52-17=35$ . Therefore, Gretzky was 17 years old when he began his professional career.
110.  $40+32=72$ . Therefore, the team scoring record is 72 points.
111.  $722+380=1102$ . Therefore, the bench shirt world record is 1102 pounds.
112.  $9390-936=8454$ . Therefore, the value of the Dow at the start of the day was 8454.
113.  $12,000,000-6,000,000=6,000,000$ . In 2000 there were 6,000,000 who received temporary assistance.
114.  $4,000,000+1,000,000=5,000,000$ . In 2004 there were 5,000,000 who received temporary assistance.
115.  $12,000,000-6,000,000=6,000,000$ . Therefore, we must decrease the number of recipients by 6,000,000.
116.  $4,000,000+2,000,000=6,000,000$ . In the year 2000 the number of recipients will be 6,000,000.

### **Sections 1.1 and 1.2 Checking Basic Concepts**

- a) The digit 3 is the fifth digit from the right. It is in the tens-thousand place.  
b) The digit 3 is the third digit from the right. It is in the hundreds place.
- In expanded form 74,293 can be written as  $70,000+4000+200+90+3$ .

3. Forty-eight million, two hundred thirty-nine thousand, six hundred ten can be written in standard form as 48,239,610.



5. a)  $67 > 25$  since 67 is to the right of 25 on the number line.  
b)  $15 < 51$  since 15 is to the left of 51 on the number line.

6. a) 
$$\begin{array}{r} 11 \\ 3736 \\ + 581 \\ \hline 4317 \end{array}$$

b) 
$$\begin{array}{r} 11 \ 11 \\ 204,633 \\ + 5897 \\ \hline 210,530 \end{array}$$

7. a) 
$$\begin{array}{r} 7 \ 13 \\ 878\cancel{8} \\ - 124 \\ \hline 8659 \end{array}$$

b) 
$$\begin{array}{r} 2 \ 13 \ 14 \\ 71\cancel{7}, \cancel{44}8 \\ - 112,564 \\ \hline 600,884 \end{array}$$

8. a) The corresponding mathematical expression is  $97 - 45$ , which results in 52.  
b) The corresponding mathematical expression is  $106 + 73$ , which results in 179.
9. a) The solution is 5 because  $3 + 5 = 8$  is a true statement.  
b) The solution is 29 because  $29 - 22 = 7$  is a true statement.
10. The perimeter is  $28 + 26 + 20 + 14 + 8 + 12 = 108$  cm.

### **Section 1.3 Multiplying and Dividing Whole Numbers; Area**

1. addition
2. factors
3. product
4. commutative
5. associative
6. identity
7. zero
8. distributive
9. multiplication
10. subtraction
11. dividend, divisor
12. quotient
13. identity
14. 0, undefined
15. long division
16. division

17. 1 square unit
18. area
19. Associative property
20. Associative property
21. Commutative property
22. Commutative property
23. Identity property
24. Identity property
25. Distributive property
26. Distributive property
27. Zero property
28. Zero property
29.  $5 \cdot 6 + 5 \cdot 9$
30.  $7 \cdot 2 + 7 \cdot 5$
31.  $4 \cdot 8 - 4 \cdot 1$
32.  $6 \cdot 9 - 6 \cdot 3$
33.  $6 \cdot 3 - 2 \cdot 3$
34.  $5 \cdot 4 + 7 \cdot 4$
35.  $7 \times 1 = 7$
36.  $0 \cdot 9 = 0$
37.  $0 \cdot 5 = 0$
38.  $1 \times 12 = 12$
39.  $6(9) = 54$
40.  $(4)(8) = 32$
41. 
$$\begin{array}{r} 48 \\ \times 7 \\ \hline 336 \end{array}$$
42. 
$$\begin{array}{r} 83 \\ \times 5 \\ \hline 415 \end{array}$$
43. 
$$\begin{array}{r} 302 \\ \times 6 \\ \hline 1812 \end{array}$$

$$\begin{array}{r} 67 \\ 479 \\ 44. \times \underline{8} \\ 3832 \end{array}$$

$$\begin{array}{r} 71 \\ \times 24 \\ 45. \quad 284 \\ \underline{1420} \\ 1704 \end{array}$$

$$\begin{array}{r} 3 \\ 94 \\ 46. \times \underline{18} \\ 752 \\ \underline{940} \\ 1692 \end{array}$$

$$\begin{array}{r} 2 \\ 172 \\ 47. \times \underline{14} \\ 688 \\ \underline{1720} \\ 2408 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 492 \\ 48. \times \underline{23} \\ 1476 \\ \underline{9840} \\ 11,316 \end{array}$$

$$\begin{array}{r} 121 \\ 232 \\ 1475 \\ 49. \times \underline{35} \\ 7375 \\ \underline{44250} \\ 51,625 \end{array}$$

$$\begin{array}{r} 1 \\ 1 \\ 9012 \\ 50. \times \underline{56} \\ 54072 \\ \underline{450600} \\ 504,672 \end{array}$$

$$\begin{array}{r} 11 \\ 32 \\ 32 \\ 754 \\ 51. \times \underline{376} \\ 4524 \\ 52780 \\ \underline{226200} \\ 283,504 \end{array}$$

$$\begin{array}{r} 11 \\ 533 \\ \times \underline{126} \\ 52. \quad 3198 \\ 10660 \\ \underline{53300} \\ 67,158 \end{array}$$

$$\begin{array}{r} 63 \\ 1074 \\ \times \underline{109} \\ 53. \quad 9666 \\ 0000 \\ \underline{107400} \\ 117,066 \end{array}$$

$$\begin{array}{r} 112 \\ 113 \\ 1 \\ 2348 \\ 54. \times \underline{342} \\ 4696 \\ 93920 \\ \underline{704400} \\ 803,016 \end{array}$$

$$55. \quad 21,000$$

$$56. \quad 60,000$$

57. 680,000

58. 3,200,000

59. 1,500,000

60. 64,000

61.  $9 \div 1 = 9$

62.  $\frac{0}{4} = 0$

63.  $\frac{17}{17} = 1$

64.  $12 \div 0$  is undefined.

65.  $88 \div 8 = 11$

66.  $81 \div 9 = 9$

67.  $\frac{25}{0}$  is undefined.

68.  $\frac{72}{24} = 3$

69.  $0 \div 13 = 0$

70.  $34 \div 1 = 34$

71.  $391 \div 391 = 1$

72. 
$$\begin{array}{r} 59 \\ 6 \overline{)354} \\ \underline{30} \phantom{0} \\ 54 \\ \underline{54} \\ 0 \end{array}$$

73. 
$$\begin{array}{r} 12 \\ 6 \overline{)72} \\ \underline{6} \phantom{0} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

74.  $\frac{1026}{1026} = 1$

$$75. \begin{array}{r} 961 \\ 7 \overline{)6729} \quad 961r2 \\ \underline{63} \\ 42 \\ \underline{42} \\ 9 \\ \underline{7} \\ 2 \end{array}$$

$$76. \begin{array}{r} 645 \\ 9 \overline{)5812} \quad 645r7 \\ \underline{54} \\ 41 \\ \underline{36} \\ 52 \\ \underline{45} \\ 7 \end{array}$$

$$77. \begin{array}{r} 80 \\ 31 \overline{)2487} \quad 80r7 \\ \underline{248} \\ 7 \end{array}$$

$$78. \begin{array}{r} 88 \\ 53 \overline{)4679} \quad 88r15 \\ \underline{424} \\ 439 \\ \underline{424} \\ 15 \end{array}$$

$$79. \begin{array}{r} 200 \\ 30 \overline{)6000} \\ \underline{60} \end{array}$$

$$80. \begin{array}{r} 400 \\ 20 \overline{)8000} \\ \underline{80} \end{array}$$

81.  $9874 \div 0$  is undefined.

$$82. \frac{0}{5430} = 0$$



$$\begin{array}{r}
 126 \\
 84 \overline{)10,651} \quad 126r67 \\
 \underline{84} \\
 225 \\
 \underline{168} \\
 571 \\
 \underline{504} \\
 67
 \end{array}$$

$$\begin{array}{r}
 249 \\
 99 \overline{)24,682} \quad 249r31 \\
 \underline{198} \\
 488 \\
 \underline{396} \\
 922 \\
 \underline{891} \\
 31
 \end{array}$$

$$\begin{array}{r}
 65 \\
 567 \overline{)36,855} \\
 \underline{3402} \\
 2835 \\
 \underline{2835}
 \end{array}$$

$$\begin{array}{r}
 81 \\
 943 \overline{)76,383} \\
 \underline{7544} \\
 943 \\
 \underline{943}
 \end{array}$$

$$\begin{array}{r}
 62 \\
 791 \overline{)49,777} \quad 62r735 \\
 \underline{4746} \\
 2317 \\
 \underline{1582} \\
 735
 \end{array}$$

$$\begin{array}{r}
 47 \\
 665 \overline{)31,896} \quad 47r641 \\
 \underline{2660} \\
 5296 \\
 \underline{4655} \\
 641
 \end{array}$$

89. The corresponding mathematical expression is  $14 \cdot 3$ , which is equivalent to 42 square feet.

90. The corresponding mathematical expression is  $2 \cdot 50$ , which is equivalent to 100 pounds.

91. The corresponding mathematical expression is  $5 \cdot 15$ , which is equivalent to \$75.
92. The corresponding mathematical expression is  $31 \cdot 65$ , which is equivalent to 2015 text messages.
93. The corresponding mathematical expression is  $126 \div 7$ , which is equivalent to 18 miles per gallon.
94. The corresponding mathematical expression is  $1200 \div 20$ , which is equivalent to 60 boxes.
95. The corresponding mathematical expression is  $75 \div 15$ , which is equivalent to 5 days.
96. The corresponding mathematical expression is  $516 \div 43$ , which is equivalent to 12 people per table.
97. The solution is 3 since  $12 \div 3 = 4$  is a true statement.
98. The solution is 3 since  $3 \times 7 = 21$  is a true statement.
99. The solution is 8 since  $5 \times 3 = 15$  is a true statement.
100. The solution is 4 since  $16 \div 4 = 4$  is a true statement.
101. The solution is 50 since  $50 \div 10 = 5$  is a true statement.
102. The solution is 20 since  $5 \times 20 = 100$  is a true statement.
103. The solution is 6 since  $6 \times 6 = 36$  is a true statement.
104. The solution is 27 since  $27 \div 3 = 9$  is a true statement.
105. Area is  $8 \times 5 = 40$  square inches.
106. Area is  $18 \times 7 = 126$  square feet.
107. Area is  $17 \times 17 = 289$  square miles.
108. Area is  $50 \times 34 = 1700$  square yds.
109. Area is  $90 \times 90 = 8100$  square feet.
110. Area is  $78 \times 36 = 2808$  square feet.
111.  $110 \times 3 = 330$ . Therefore, the multiplier is 3.
112.  $7 \times 10 = 70$ . Therefore, the state that has 7 times as many species is Virginia.
113.  $3,000,000 \times 10 = 30,000,000$ . The revenue is \$30 million.
114.  $11,000,000 \times 10 = 110,000,000$  The revenue is \$110 million.
115.  $11 \times 3 = 33$  The phone has 33 hours of talk time.
116.  $4 \times 2 = 8$  The phone has an 8 inch screen.
117.  $8 \times 8 = 64$  The result is 8 squares.  $32 \times 2 = 64$  The board has 32 squares on one side.
118.  $3 \times 3 = 9$  The result is 3 squares. The first player gets 5 turns and the second player gets 4 turns.
119.  $125,000 \div 25 = 5000$ . Therefore, the number of homes is 5000.
120.  $10 \div 2 = 5$ . Therefore, Utah has 5 national forests.
121.  $7 \cdot 0 = 0$ . Therefore, 73 bottles of drinking water has 0 calories.
122.  $3 \cdot 100 = 300$ . Therefore, 3 cans of grape soda have 300 calories.
123.  $600 \cdot 400 = 240,000$ . Therefore, the total is 240,000 pixels.
124.  $400 \cdot 300 = 120,000$ . Therefore, the total is 120,000 pixels.
125.  $16,000 \div 64 = 250$ . Therefore, there are 250 songs per gigabyte.

126.  $20,000 \div 16 = 1250$ . Therefore, there are 1250 photos per gigabyte.
127. a)  $150 \div 10 = 15$ . Therefore, the length of a side is 15 feet.  
b) Perimeter is  $10+10+15+15 = 50$  feet.
128.  $48 \div 8 = 6$ . Therefore, the width is 6 inches.
129.  $13 \div 2 = 6r1$ ,  $13 \div 3 = 4r1$ ,  $13 \div 4 = 3r1$ . Therefore, the number is 13.
130.  $30 \div 6 = 5$ . Therefore, the number is 5.
131.  $20 \div 6 = 3r2$ . Therefore, the maximum number of purchased flash drives is 3. The person will receive \$2 in change.
132.  $80 \div 16 = 5r0$ . Therefore, the maximum number of purchased DVDs is 5. The person will not receive any change.

### **Group Activity**

- a).  $400,000,000 - 2 \cdot 175,223,510 = 400,000,000 - 350,447,020 = 49,552,980$ . Therefore, the total profit is \$49,552,980.
- b).  $175,223,510 \div 60 = 2,920,391r50$
- c).  $2,920,391 \div 60 = 48,673r11$
- d)  $48,673 \div 24 = 2028r1$
- e)  $2028 \div 365 = 5r203$
- f) Taxes, possible shared winnings. Answers may vary.

### **Section 1.4 Exponents, Variables, and Algebraic Expressions**

1. exponential notation
2. 4, 7
3. 2
4. 3
5. 9
6.  $10^7$
7. variable
8. algebraic expression
9. equation
10. formula
11.  $P = 2l + 2w$
12.  $A = s^2$

13. evaluate
14. variable
15. expression
16. equation
17. The factor 8 is repeated 3 times. The exponential notation is  $8^3$ .
18. The factor 4 is repeated 6 times. The exponential notation is  $4^6$ .
19. The factor 2 is repeated 5 times. The exponential notation is  $2^5$ .
20. The factor 9 is repeated 2 times. The exponential notation is  $9^2$ .
21. The factor 2 is repeated 3 times and the factor 5 is repeated 2 times.  
The exponential notation is  $2^3 \cdot 5^2$ .
22. The factor 4 is repeated 2 times and the factor 6 is repeated 4 times.  
The exponential notation is  $4^2 \cdot 6^4$ .
23. The factor 5 is repeated 3 times and the factor 7 is repeated 3 times.  
The exponential notation is  $5^3 \cdot 7^3$ .
24. The factor 3 is repeated 1 time and the factor 9 is repeated 3 times.  
The exponential notation is  $3 \cdot 9^3$ .
25. The factor 7 is repeated 2 times. The exponential notation is  $7^2$ .
26. The factor 5 is repeated 3 times. The exponential notation is  $5^3$ .
27. The factor 4 is repeated 9 times. The exponential notation is  $4^9$ .
28. The factor 1 is repeated 3 times. The exponential notation is  $1^3$ .
29. The factor 2 is repeated 3 times. The exponential notation is  $2^3$ .
30. The factor 10 is repeated 6 times. The exponential notation is  $10^6$ .
31. The factor 3 is repeated 5 times. The exponential notation is  $3^5$ .
32. The factor 8 is repeated 2 times. The exponential notation is  $8^2$ .
33.  $9 \cdot 9 = 81$
34.  $2 \cdot 2 \cdot 2 = 8$
35.  $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$
36.  $3 \cdot 3 \cdot 3 \cdot 3 = 81$
37.  $4 \cdot 4 \cdot 4 \cdot 4 = 256$
38.  $7 \cdot 7 \cdot 7 = 343$
39.  $6 \cdot 6 \cdot 6 = 216$
40.  $5 \cdot 5 \cdot 5 = 125$
41.  $10 \cdot 10 \cdot 10 = 1000$
42.  $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 10,000,000$

