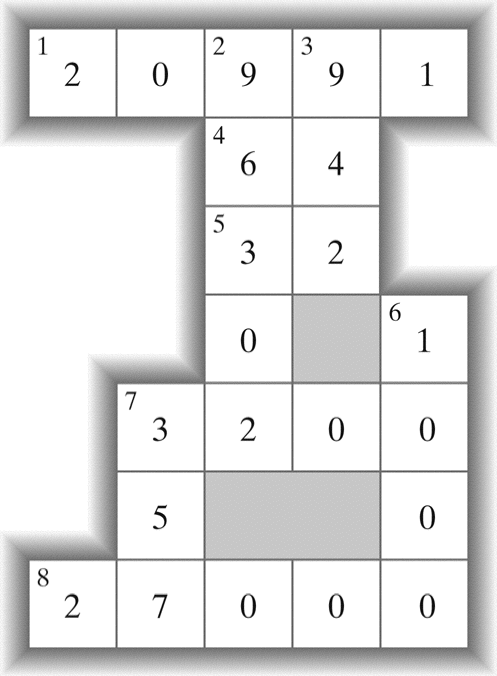
Chapter 1 Whole Numbers

**Are You Prepared?**



**Section 1.1 Study Tips**

# Group Activity: Becoming a Successful Student

**1.** Answers will vary.

**2.** Answers will vary.

**3.** Answers will vary.

**4.** Answers will vary.

**5.** Problem Recognition Exercises: page 114

Chapter Summary: page 123

Chapter Review Exercises: page 125

Chapter Test: page 128

Cumulative Review Exercises: page 129

**6.** Answers will vary.

**7.** Answers will vary.

**8.** Answers will vary.

**9.** Answers will vary.

**10.** Answers will vary.

**Section 1.2 Introduction to Whole Numbers**

# Section 1.2 Practice Exercises

**1.** Answers will vary.

**2. (a)** A **digit** is one of the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

**(b)** A number is written in **standard form** if the position of each digit determines the place value of the digit.

**(c)** **Periods** are groups of three digits separated by commas in a large number.

**(d)** A number is written in **expanded form** if each digit is written with its place value units.

**3.** 8,213,457  
7: ones  
5: tens  
4: hundreds  
3: thousands  
1: ten-thousands  
2: hundred-thousands  
8: millions

**4.** 103,596  
6: ones  
9: tens  
5: hundreds  
3: thousands  
0: ten-thousands  
1: hundred-thousands

**5.** 321 tens

**6.** 689 tens

**7.** 214 ones

**8.** 738 ones

**9.** 8710 hundreds

**10.** 2293 hundreds

**11.** 1430 thousands

**12.** 3101 thousands

**13.** 452,723 hundred-thousands

**14.** 655,878 hundred thousands

**15.** 1,023,676,207 billions

**16.** 3,111,901,211 billions

**17.** 22,422 ten-thousands

**18.** 58,106 ten-thousands

**19.** 51,033,201 millions

**20.** 93,971,224 millions

**21.** 10,677,881 ten-millions

**22.** 31,820  thousands

**23.** 7,653,468,440 billions

**24.** 31,000 ft ten-thousands

**25.** 5 tens + 8 ones

**26.** 7 tens + 1 one

**27.** 5 hundreds + 3 tens + 9 ones

**28.** 3 hundreds + 8 tens + 2 ones

**29.** 5 thousands + 2 hundreds + 3 ones

**30.** 7 thousands + 8 tens + 9 ones

**31.** 1 ten-thousand + 2 hundreds + 4 tens +   
1 one

**32.** 2 ten-thousands + 8 hundreds + 7 tens +   
3 ones

**33.** 524

**34.** 318

**35.** 150

**36.** 620

**37.** 1,906

**38.** 4,201

**39.** 85,007

**40.** 26,002

**41.** ones, thousands, millions, billions

**42.** ones, tens, hundreds, thousands

**43.** Two hundred forty-one

**44.** Three hundred twenty-seven

**45.** Six hundred three

**46.** One hundred eight

**47.** Thirty-one thousand, five hundred thirty

**48.** Fifty-two thousand, one hundred sixty

**49.** One hundred thousand, two hundred thirty-four

**50.** Four hundred thousand, one hundred ninety-nine

**51.** Nine thousand, five hundred thirty-five

**52.** One thousand, three hundred seventy-seven

**53.** Twenty thousand, three hundred twenty

**54.** One thousand, eight hundred

**55.** Five hundred ninety thousand, seven hundred twelve

**56.** Sixty million

**57.** 6005

**58.** 4004

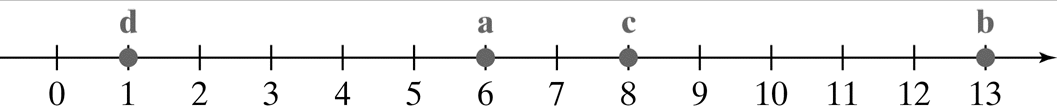
**59.** 672,000

**60.** 248,000

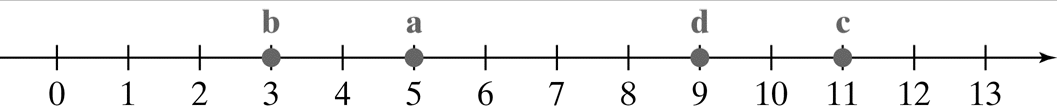
**61.** 1,484,250

**62.** 2,647,520

**63.**



**64.**



**65.** Counting on a number line, 10 is 4 units to the right of 6.

**66.** Counting on a number line, 3 is 8 units to the left of 11.

**67.** Counting on a number line, 4 is 3 units to the left of 7.

**68.** Counting on a number line, 5 is 5 units to the right of 0.

**69.** 8 > 2  
8 is greater than 2, or 2 is less than 8.

**70.** 6 < 11  
6 is less than 11, or 11 is greater than 6.

**71.** 3 < 7  
3 is less than 7, or 7 is greater than 3.

**72.** 14 > 12  
14 is greater than 12, or 12 is less than 14.

**73.** 6 < 11

**74.** 14 > 13

**75.** 21 > 18

**76.** 5 < 7

**77.** 3 < 7

**78.** 14 < 24

**79.** 95 > 89

**80.** 28 < 30

**81.** 0 < 3

**82.** 8 > 0

**83.** 90 < 91

**84.** 48 > 47

**85.** False; 12 is made up of the digits 1 and 2.

**86.** False; 26 is made up of the digits 2 and 6.

**87.** 99

**88.** 999

**89.** There is no greatest whole number.

**90.** 0 is the least whole number.

**91.** 10,000,000 7 zeros

**92.** 100,000,000,000 11 zeros

**93.** 964

**94.** 840

**Section 1.3 Addition and Subtraction of Whole Numbers and Perimeter**

Section 1.3 Practice Exercises

**1.** Answers will vary.

**2. (a)** A **sum** is the result of an addition problem.

**(b)** The **addends** are the numbers being added.

**(c)** A **polygon** is a flat figure formed by line segments connected at their ends.

**(d)** The **perimeter** of a polygon is the distance around the outside of the figure.

**(e)** The **difference** is the result of a subtraction problem.

**(f)** The **subtrahend** is the number being subtracted.

**(g)** The **minuend** is the number being subtracted from.

**(h)** A **variable** is a letter or symbol that represents a number.

**3.** 3 hundreds + 5 tens + 1 one

**4.** 2004

**5.** 4012

**6.** 6206

**7.** Fill in the table. Use the number line if necessary.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **+** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| **0** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **1** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **2** | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **3** | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **4** | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| **5** | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| **6** | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **7** | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| **8** | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| **9** | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

**8.** 11 + 10 = 21  
Addends: 11, 10  
Sum: 21

**9.** 1 + 13 + 4 = 18  
Addends: 1, 13, 4  
Sum: 18

**10.** 5 + 8 + 2 = 15  
Addends: 5, 8, 2  
Sum: 15

**11.**



**12.**



**13.**



**14.**



**15.**



**16.**



**17.**



**18.**



**19.**



**20.**



**21.**



**22.**



**23.**



**24.**



**25.**



**26.**



**27.**



**28.**



**29.**



**30.**



**31.** 

**32.** 

**33.** 101 + 44 = 44 + 101

**34.** 8 + 13 = 13 + 8

**35.** 

**36.** 

**37.** (23 + 9) + 10 = 23 + (9 + 10)

**38.** 7 + (12 + 8) = (7 + 12) + 8

**39.** *r* + (*s* + *t*) = (*r* + *s*) + *t*

**40.** (*c* + *d*) + *e* = *c* + (*d* + *e*)

**41.** The commutative property changes the order of the addends, and the associative property changes the grouping.

**42.** The sum of any number and 0 is that number.

**(a)** 423 + 0 = 423

**(b)** 0 + 25 = 25

**(c)** 67 + 0 = 67

**(d)** 0 + *x* = *x*

**43.** 12 − 8 = 4  
minuend: 12  
subtrahend: 8  
difference: 4

**44.**   
minuend: 9  
subtrahend: 6  
difference: 3



**45.** 27 − 9 = 18 because 18 + 9 = 27.

**46.** 20 − 8 = 12 because 12 + 8 = 20.

**47.** 102 − 75 = 27 because 27 + 75 = 102.

**48.** 211 − 45 = 166 because 166 + 45 = 211.

**49.** 8 − 3 = 5 Check: 5 + 3 = 8

**50.** 7 − 2 = 5 Check: 5 + 2 = 7

**51.** 4 − 1 = 3 Check: 3 + 1 = 4

**52.** 9 − 1 = 8 Check: 8 + 1 = 9

**53.** Check: 



**54.** Check: 



**55.** Check: 



**56.**  Check: 

**57.** Check: 



**58.** Check: 



**59.** Check: 



**60.**  Check: 

**61.** Check: 



**62.** Check: 



**63.**  Check: 

**64.**  Check: 

**65.** Check: 



**66.**  Check: 

**67.**  Check: 

**68.**  Check: 

**69.**  Check: 

**70.** Check: 



**71.** Check: 



**72.** Check: 



**73.** The expression 7 − 4 means 7 minus 4, yielding a difference of 3. The expression   
4 − 7 means 4 minus 7 which results in a difference of −3.

**74.** Subtraction is not associative. For example, 10 − (6 − 2) = 10 − 4 = 6, and   
(10 − 6) − 2 = 4 − 2 = 2. Therefore   
10 − (6 − 2) does not equal (10 − 6) − 2.

**75.** 13 + 7



**76.** 100 + 42



**77.** 7 + 45



**78.** 23 + 81



**79.** 18 + 5



**80.** 76 + 2



**81.** 1523 + 90 

**82.** 1320 + 448 

**83.** 5 + 39 + 81



**84.**



**85.**



**86.**



**87.**



**88.**



**89.**



**90.**



**91.** 

**92.** 

**93.**   
The shows had a total of   
74,283,000 viewers.

**94.**   
521 deliveries were made.

**95.**   
423 desks were delivered.



**96.**   
The total amount is $200.

**97.**   
Denali is 6074 ft higher than White Mountain Peak.

**98.**   
16 DVDs are left.



**99.**   
The difference is 7748 marriages.



**100.**   
The decrease is 150,000 marriages.

**101.**   
The difference is 195,489 marriages.

**102.**   
The greatest increase occurred between 1995−2000; the increase was 62,000 marriages.



**103.**   
There are 821,024 nonteachers.



**104.**   
The total cost is $21,637.



**105.**   
Mt. Washington is 4256 ft higher than the Pinkham Notch Visitor Center.

**106.** 

*The Lion King* had been performed 1979 more times.

**107.** 

Jeannette will pay $29,560 for 1 year.

**108.** 

They are 234 miles apart.

**109.**



**110.**



**111.**



**112.** 

**113.**



**114.**



**115.**   
The missing length is 13 m.



**116.**   
The missing length is 120 cm.



**117.** 

**118.**



**119.** 

**120.**



**121.**



**122.** 

**123.**   
The difference in land area between Colorado and Wisconsin is 

**124.**   
Tennessee has  more than West Virginia.

**125.**   
The combined land area of Rhode Island, Tennessee, and Wisconsin is 

**126.**   
The combined land area of the five states is 

**Section 1.4 Rounding and Estimating**

Section 1.4 Practice Exercises

**1.** Answers will vary

**2.** **Rounding** a number allows us to give an approximation of the number to a specific place value.

**3.**



**4.**



**5.** 

**6.**



**7.** Ten-thousands

**8.** Hundreds

**9.** If the digit in the tens place is 0, 1, 2, 3, or 4, then change the tens and ones digits to 0. If the digit in the tens place is 5, 6, 7, 8, or 9, increase the digit in the hundreds place by 1 and change the tens and ones digits to 0.

**10.** If the digit in the ones place is 0, 1, 2, 3, or 4, then change the ones digits to 0. If the digit in the ones place is 5, 6, 7, 8, or 9, increase the digit in the tens place by 1 and change the ones digit to 0.

**11.** 342 ≈ 340

**12.** 834 ≈ 830

**13.** 725 ≈ 730

**14.** 445 ≈ 450

**15.** 9384 ≈ 9400

**16.** 8363 ≈ 8400

**17.** 8539 ≈ 8500

**18.** 9817 ≈ 9800

**19.** 34,992 ≈ 35,000

**20.** 76,831 ≈ 77,000

**21.** 2578 ≈ 3000

**22.** 3511 ≈ 4000

**23.** 9982 ≈ 10,000

**24.** 7974 ≈ 8000

**25.** 109,337 ≈ 109,000

**26.** 437,208 ≈ 437,000

**27.** 489,090 ≈ 490,000

**28.** 388,725 ≈ 390,000

**29.** $148431,020 ≈ $148,000,000

**30.** $33,050 ≈ $33,000

**31.** 238,863 mi ≈ 239,000 mi

**32.** 492,000 ≈ 500,000



**33.**



**34.**



**35.**  



**36.**  



**37.**   

**38.**   

**39.**  



**40.**  



**41.**   
$151,000,000 was brought in by Mars.



**42.**   
$173,000,000 was brought in by Hershey.



**43.**    
Neil Diamond earned $11,000,000 more.



**44.**   
4000 more women gave birth.



**45.**   

**46.**   

**47. (a)** 2003; $3,470,295 → $3,500,000

**(b)** 2005; $1,970,380 → $2,000,000

**48.** 

**49.** Massachusetts; 78,815 → 79,000 students

**50.** Vermont; 8059 → 8000 students

**51.**   
The difference is 71,000 students.

**52.**   
The total is 189,000 students.



**53.**



**54.**



**55.**   

**56.**



**Section 1.5 Multiplication of Whole Numbers and Area**

Section 1.5 Practice Exercises

**1.** Answers will vary.

**2. (a)** **Multiplication** is repeated addition.

**(b)** The numbers that are multiplied are called **factors.**

**(c)** The result of multiplication is called the **product.**

**(d)** **Area** measures the amount of surface contained within a region.

**(e)** The **area of a rectangle** is the product of the length and the width.

**3.**



**4.**



**5.**



|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **6.** | × | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
|  | **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | **1** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|  | **2** | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
|  | **3** | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
|  | **4** | 0 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
|  | **5** | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
|  | **6** | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|  | **7** | 0 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 |
|  | **8** | 0 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |
|  | **9** | 0 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 |

**7.** 5 + 5 + 5 + 5 + 5 + 5 = 6 × 5 = 30

**8.** 

**9.** 9 + 9 + 9 = 3 × 9 = 27

**10.** 7 + 7 + 7 + 7 = 4 × 7 = 28

**11.** 13 × 42 = 546  
factors: 13, 42; product: 546

**12.** 26 × 9 = 234  
factors: 26, 9; product: 234

**13.** 3 ⋅ 5 ⋅ 2 = 30  
factors: 3, 5, 2; product: 30

**14.** 4 ⋅ 3 ⋅ 8 = 96  
factors: 4, 3, 8; product: 96

**15.** For example: 5 × 12; 5 ⋅ 12; 5(12)

**16.** For example: 23 × 14; 23 ⋅ 14; 23(14)

**17.** d

**18.** a

**19.** e

**20.** b

**21.** c

**22.** a

**23.** 14 • 8 = 8 •14

**24.** 3 • 9 = 9 • 3

**25.** 6 • (2 • 10) = (6 • 2) • 10

**26.** (4 • 15) • 5 = 4 • (15 • 5)

**27.** 5(7 + 4) = (5 • 7) + (5 • 4)

**28.** 3(2 + 6) = (3 • 2) + (3 • 6)

**29.**



**30.**



**31.**



**32.**



**33.**



**34.** 

**35.**



**36.**



**37.**



**38.**



**39.**



**40.**



**41.**



**42.**



**43.**



**44.**



**45.**



**46.**



**47.**



**48.**



**49.**



**50.**



**51.** 

**52.**



**53.**



**54.**



**55.**



**56.**



**57.** 

**58.**



**59.** 

**60.** 

**61.** = 24,000



**62.** = 45,000



**63.** = 2,100,000



**64.** = 1,600,000



**65.** = 72,000,000



**66.** = 2,000,000



**67.** = 36,000,000



**68.**  = 300,000,000

**69.**



**70.** 

**71.**



**72.**



**73.**



**74.**



**75.**  = $1,370,000

**76.**   
 per week



**77.**   
4000 minutes can be stored.

**78.** 

15 CD’s hold 10,500 MB of data

**79.**



**80.** 

It can go 1100 miles on 20 gallons of gas.

**81.**   
A case contains 144 fl oz.



**82.** 

The class meets for 48 hours.

**83.**   
287,500 sheets of paper are delivered.



**84.**   
She gets 168 g of protein.



**85.**   
He can travel 372 miles.



**86.**   
Sherica schedules 736 hr.

**87.** *A* = *l* × *w*  
*A* = (23 ft) × (12 ft)  
  
The area is



**88.**



**89.** *A* = *l* × *w*  
*A* = (73 cm) × (73 cm)  
  
The area is



**90.** *A* = *l* × *w*  
*A* = (41 yd) × (41 yd)  
  
The area is



**91.** *A* = *l* × *w*  
*A* = (390 mi) × (270 mi)  
  
The area is 

**92.** *A* = *l* × *w*  
*A* = (130 yd) × (150 yd)  
  
The area is 

**93. (a)** *A* = *l* × *w*  
 *A* = (40 in.) × (60 in.)  
  

**(b)**   
There are 42 windows.



**(c)**   
The total area is 

**94.** *A* = *l* × *w*  
*A* = (50 ft.) × (30 ft.)  
  
The area is 

**95.** *A* = *l* × *w*  
*A* = (8 ft) × (16 ft)  
  
The area is



**96.** *A* = *l* × *w*  
*A* = (10 yd) × (15 yd) = 

**Section 1.6 Division of Whole Numbers**

Section 1.6 Practice Exercises

**1.** Answers will vary.

**2. (a)** **Division** is the process of separating a number into equal groups.

**(b)** The **dividend** is the number being divided.

**(c)** The **divisor** is the number of groups.

**(d)** The **quotient** is the result of the division.

**(e) Long division** uses a series of estimates to find the quotient when dividing larger numbers.

**(f)** The **remainder** is the “leftover” piece if a divisor does not divide the dividend evenly.

**(g)** The **whole part of the quotient** is the number of times the divisor goes into the dividend without the remainder.

**3.** 

**4.**



**5.**



**6.** 

**7.**



**8.**



**9.**



**10.**



**11.** 72 ÷ 8 = 9 because 9 × 8 = 72.  
dividend: 72  
divisor: 8  
quotient: 9

**12.** 32 ÷ 4 = 8 because 8 × 4 = 32.  
dividend: 32  
divisor: 4  
quotient: 8

**13.** because 8 × 8 = 64.  
dividend: 64  
divisor: 8  
quotient: 8



**14.** because 7 × 5 = 35.  
dividend: 35  
divisor: 5  
quotient: 7



**15.** because 5 × 9 = 45.  
dividend: 45  
divisor: 9  
quotient: 5



**16.** because 4 × 5 = 20.  
dividend: 20  
divisor: 5  
quotient: 4



**17.** You cannot divide a number by zero (the quotient is undefined). If you divide zero by a number (other than zero), the quotient is always zero.

**18.** A number divided or multiplied by 1 remains unchanged.

**19.** 15 ÷ 1 = 15 because 15 × 1 = 15.

**20.** because 1 × 21 = 21.



**21.** 0 ÷ 10 = 0 because 0 × 10 = 0.

**22.** because 0 × 3 = 0.



**23.** is undefined because division by zero is undefined.



**24.** 4 ÷ 0 is undefined because division by zero is undefined.

**25.** because 1 × 20 = 20.



**26.** because 9 × 1 = 9.



**27.** is undefined because division by zero is undefined.



**28.** because 5 × 1 = 5.



**29.** because 0 × 8 = 0.



**30.** 13 ÷ 13 = 1 because 13 × 1 = 13.

**31.** 6 ÷ 3 = 2 because 2 × 3 = 6.  
3 ÷ 6 ≠2 because 2 × 6 ≠ 3.

**32.** (36 ÷ 12) ÷ 3 = 3 ÷ 3 = 1 but  
36 ÷ (12 ÷ 3) = 36 ÷ 4 = 9.

**33.** To check a division problem without a remainder you should multiply the quotient and the divisor to get the dividend.

**34.** To check 0 ÷ 5 = 0 we multiply 0 × 5 = 0 which is true. If we try to check 5 ÷ 0 = ? we need to find a number to multiply by 0 to get 5. Since no such number exists, the answer to 5 ÷ 0 is undefined.

**35.** ✓



**36.** ✓



**37.** ✓



**38.**   ✓

**39.** ✓



**40.** ✓



**41.** ✓



**42.** ✓



**43.**   ✓

**44.**   ✓

**45.** ✓



**46.** ✓



**47.** correct



**48.** correct



**49.**  incorrect 

**50.**  incorrect 

**51.**



**52.**



**53.** incorrect



**54.** incorrect



**55.** 



**56.** 



**57.** 



**58.** 



**59.** 



**60.** 



**61.** 



**62.**  

**63.** 



**64.** 



**65.** ✓



**66.** ✓



**67.** ✓



**68.**  ✓



**69.**  ✓



**70.** ✓



**71.**



**72.**



**73.**



**74.**



**75.**



**76.**



**77.**



**78.**



**79.** 

**80.** 

**81.** 

**82.** 

**83.**



**84.**



**85.** 

**86.** 

**87.** 497 ÷ 71 = 7



**88.** 1890 ÷ 45 = 42



**89.** 877 ÷ 14 = 62 R 9



**90.** 722 ÷ 53 = 13 R 33



**91.** 42 ÷ 6 = 7

**92.** 108 ÷ 9 = 12



**93.**



**94.**



**95.**   
5 cases; 8 cans left over



**96.**   
Yes; $9 left over



**97.** 

There will be 120 classes of Beginning Algebra.

**98.**   
Each person will receive $10,560.

**99.** 

There will be 9 gallons used.

**100.** 

The couple traveled for 26 hours.

**101.** 1200 ÷ 20 = 60  
  
Approximately 60 words per minute



**102.** 2800 ÷ 400  
  
Approximately 7 tanks of gas



**103.**   
Yes, they can all attend if they sit in the second balcony.



**104.**   
Teacher: $3000 Professor: $5,000



CEO: $10,000 Programmer: $4,000



**105.** bbl

