

# Chapter R

## Section R.1 Practice Exercises

- $10 = 1 \cdot 10$ ,  $10 = 2 \cdot 5$   
The factors of 10 are 1, 2, 5, and 10.
- $18 = 1 \cdot 18$ ,  $18 = 2 \cdot 9$ ,  $18 = 3 \cdot 6$   
The factors of 18 are 1, 2, 3, 6, 9, and 18.
- 5 is a prime number. Its factors are 1 and 5 only.  
16 is a composite number. Its factors are 1, 2, 4, 8, and 16.  
23 is a prime number. Its factors are 1 and 23 only.  
42 is a composite number. Its factors are 1, 2, 3, 6, 7, 14, 21, and 42.
- $44 = 4 \cdot 11 = 2 \cdot 2 \cdot 11$   
The prime factorization of 44 is  $2 \cdot 2 \cdot 11$ .
- $60 = 4 \cdot 15 = 2 \cdot 2 \cdot 3 \cdot 5$   
The prime factorization of 60 is  $2 \cdot 2 \cdot 3 \cdot 5$ .
- $$\begin{array}{r} 11 \\ 3 \overline{) 33} \\ 3 \overline{) 99} \\ 3 \overline{) 297} \end{array}$$
  
The prime factorization of 297 is  $3 \cdot 3 \cdot 3 \cdot 11$ .
- $14 = 2 \cdot 7$   
 $35 = 5 \cdot 7$   
 $\text{LCM} = 2 \cdot 5 \cdot 7 = 70$
- $5 = 5$   
 $9 = 3 \cdot 3$   
 $\text{LCM} = 3 \cdot 3 \cdot 5 = 45$
- $4 = 2 \cdot 2$   
 $15 = 3 \cdot 5$   
 $10 = 2 \cdot 5$   
 $\text{LCM} = 2 \cdot 2 \cdot 3 \cdot 5 = 60$

## Vocabulary, Readiness & Video Check R.1

- The number 40 equals  $2 \cdot 2 \cdot 2 \cdot 5$ . Since each factor is prime, we call  $2 \cdot 2 \cdot 2 \cdot 5$  the prime factorization of 40.
- A natural number, other than 1, that is not prime is called a composite number.

- A natural number that has exactly two different factors, 1 and itself, is called a prime number.
- The least common multiple of a list of numbers is the smallest number that is a multiple of all the numbers in the list.
- To factor means to write as a product.
- A multiple of a number is the product of that number and any natural number.
- No, the natural number 1 is neither prime nor composite.
- We may write factors in different order, but every natural number has only one prime factorization.
- The least common multiple, LCM, of a list of numbers is the smallest number that is a multiple of each number in the list.

## Exercise Set R.1

- $8 = 1 \cdot 8$ ,  $8 = 2 \cdot 4$   
The factors of 8 are 1, 2, 4, and 8.
- $36 = 1 \cdot 36$ ,  $36 = 2 \cdot 18$ ,  $36 = 3 \cdot 12$ ,  $36 = 4 \cdot 9$ ,  
 $36 = 6 \cdot 6$   
The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18, and 36.
- $63 = 1 \cdot 63$ ,  $63 = 3 \cdot 21$ ,  $63 = 7 \cdot 9$   
The factors of 63 are 1, 3, 7, 9, 21, and 63.
- $50 = 1 \cdot 50$ ,  $50 = 2 \cdot 25$ ,  $50 = 5 \cdot 10$   
The factors of 50 are 1, 2, 5, 10, 25, and 50.
- $31 = 1 \cdot 31$   
The factors of 31 are 1 and 31.
- 21 is a composite number. Its factors are 1, 3, 7, and 21.
- 53 is a prime number. Its factors are only 1 and 53.
- 51 is a composite number. Its factors are 1, 3, 17, and 51.
- 307 is a prime number. Its factors are only 1 and 307.

20. 1798 is a composite number. Its factors are 1, 2, 29, 31, 58, 62, 899, and 1798.

22.  $28 = 2 \cdot 14 = 2 \cdot 2 \cdot 7$   
The prime factorization of 28 is  $2 \cdot 2 \cdot 7$ .

24.  $30 = 2 \cdot 15 = 2 \cdot 3 \cdot 5$   
The prime factorization of 30 is  $2 \cdot 3 \cdot 5$ .

26.  $48 = 2 \cdot 24$   
 $= 2 \cdot 2 \cdot 12$   
 $= 2 \cdot 2 \cdot 2 \cdot 6$   
 $= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$   
The prime factorization of 48 is  $2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$ .

28.  $64 = 4 \cdot 4 \cdot 4 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$   
The prime factorization of 64 is  $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$ .

$$\begin{array}{r} 5 \\ 5 \overline{) 25} \\ 5 \overline{) 125} \\ 2 \overline{) 250} \\ 2 \overline{) 500} \end{array}$$

The prime factorization of 500 is  $2 \cdot 2 \cdot 5 \cdot 5 \cdot 5$ .

$$\begin{array}{r} 7 \\ 5 \overline{) 35} \\ 3 \overline{) 105} \\ 3 \overline{) 315} \end{array}$$

The prime factorization of 315 is  $3 \cdot 3 \cdot 5 \cdot 7$ .

34.  $63 = 3 \cdot 21 = 3 \cdot 3 \cdot 7$   
The prime factorization of 63 is  $3 \cdot 3 \cdot 7$ , which is choice c.

36.  $4 = 2 \cdot 2$   
 $5 = 5$   
 $\text{LCM} = 2 \cdot 2 \cdot 5 = 20$

38.  $9 = 3 \cdot 3$   
 $15 = 3 \cdot 5$   
 $\text{LCM} = 3 \cdot 3 \cdot 5 = 45$

40.  $30 = 2 \cdot 3 \cdot 5$   
 $40 = 2 \cdot 2 \cdot 2 \cdot 5$   
 $\text{LCM} = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 = 120$

42.  $2 = 2$   
 $11 = 11$   
 $\text{LCM} = 2 \cdot 11 = 22$

44.  $4 = 2 \cdot 2$   
 $18 = 2 \cdot 3 \cdot 3$   
 $\text{LCM} = 2 \cdot 2 \cdot 3 \cdot 3 = 36$

46.  $18 = 2 \cdot 3 \cdot 3$   
 $30 = 2 \cdot 3 \cdot 5$   
 $\text{LCM} = 2 \cdot 3 \cdot 3 \cdot 5 = 90$

48.  $50 = 2 \cdot 5 \cdot 5$   
 $70 = 2 \cdot 5 \cdot 7$   
 $\text{LCM} = 2 \cdot 5 \cdot 5 \cdot 7 = 350$

50.  $21 = 3 \cdot 7$   
 $28 = 2 \cdot 2 \cdot 7$   
 $\text{LCM} = 2 \cdot 2 \cdot 3 \cdot 7 = 84$

52.  $3 = 3$   
 $9 = 3 \cdot 3$   
 $20 = 2 \cdot 2 \cdot 5$   
 $\text{LCM} = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5 = 180$

54.  $3 = 3$   
 $5 = 5$   
 $7 = 7$   
 $\text{LCM} = 3 \cdot 5 \cdot 7 = 105$

56.  $9 = 3 \cdot 3$   
 $36 = 2 \cdot 2 \cdot 3 \cdot 3$   
 $72 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$   
 $\text{LCM} = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 = 72$

58.  $4 = 2 \cdot 2$   
 $14 = 2 \cdot 7$   
 $35 = 5 \cdot 7$   
 $\text{LCM} = 2 \cdot 2 \cdot 5 \cdot 7 = 140$

60. answers may vary

62.  $35 = 5 \cdot 7$   
 $20 = 2 \cdot 2 \cdot 5$   
 $\text{LCM} = 2 \cdot 2 \cdot 5 \cdot 7 = 140$   
They are in New Orleans on the same day every 140 days.

64.  $1000 = 25 \cdot 40 = 25 \cdot 5 \cdot 8$   
 $1125 = 25 \cdot 45 = 25 \cdot 5 \cdot 9$   
 $\text{LCM} = 25 \cdot 5 \cdot 8 \cdot 9 = 9000$

### Section R.2 Practice Exercises

1.  $\frac{4}{4} = 1$  since  $4 \div 4 = 1$ .

2.  $\frac{9}{3} = 3$  since  $9 \div 3 = 3$ .
3.  $\frac{10}{10} = 1$  since  $10 \div 10 = 1$ .
4.  $\frac{5}{1} = 5$  since  $5 \div 1 = 5$ .
5.  $\frac{0}{11} = 0$  since  $0 \cdot 11 = 0$ .
6.  $\frac{11}{0}$  is undefined because there is no number that when multiplied by 0 gives 11.
7.  $\frac{1}{4} = \frac{1}{4} \cdot \frac{5}{5} = \frac{1 \cdot 5}{4 \cdot 5} = \frac{5}{20}$
8.  $\frac{20}{35} = \frac{2 \cdot 2 \cdot 5}{5 \cdot 7} = \frac{4}{7}$
9.  $\frac{7}{20}$  is already simplified.
10.  $\frac{12}{40} = \frac{4 \cdot 3}{4 \cdot 10} = \frac{3}{10}$
11.  $\frac{3}{4} \cdot \frac{8}{9} = \frac{3 \cdot 8}{4 \cdot 9} = \frac{3 \cdot 4 \cdot 2}{4 \cdot 3 \cdot 3} = \frac{2}{3}$
12.  $\frac{2}{9} \div \frac{3}{4} = \frac{2}{9} \cdot \frac{4}{3} = \frac{2 \cdot 4}{9 \cdot 3} = \frac{8}{27}$
13.  $\frac{8}{11} \div 24 = \frac{8}{11} \div \frac{24}{1} = \frac{8}{11} \cdot \frac{1}{24} = \frac{8 \cdot 1}{11 \cdot 8 \cdot 3} = \frac{1}{33}$
14.  $\frac{5}{4} \div \frac{15}{8} = \frac{5}{4} \cdot \frac{8}{15} = \frac{5 \cdot 4 \cdot 2}{4 \cdot 5 \cdot 3} = \frac{2}{3}$
15.  $\frac{2}{11} + \frac{5}{11} = \frac{2+5}{11} = \frac{7}{11}$
16.  $\frac{1}{8} + \frac{3}{8} = \frac{1+3}{8} = \frac{4}{8} = \frac{4}{2 \cdot 4} = \frac{1}{2}$
17.  $\frac{7}{6} - \frac{2}{6} = \frac{7-2}{6} = \frac{5}{6}$
18.  $\frac{13}{10} - \frac{3}{10} = \frac{13-3}{10} = \frac{10}{10} = 1$
19.  $\frac{3}{8} + \frac{1}{20} = \frac{3}{8} \cdot \frac{5}{5} + \frac{1}{20} \cdot \frac{2}{2} = \frac{15}{40} + \frac{2}{40} = \frac{17}{40}$
20.  $\frac{8}{15} - \frac{1}{3} = \frac{8}{15} - \frac{1}{3} \cdot \frac{5}{5} = \frac{8}{15} - \frac{5}{15} = \frac{3}{15} = \frac{3}{3 \cdot 5} = \frac{1}{5}$
21.  $5\frac{1}{6} = \frac{6 \cdot 5 + 1}{6} = \frac{31}{6}$ ;  $4\frac{2}{5} = \frac{5 \cdot 4 + 2}{5} = \frac{22}{5}$   
 $5\frac{1}{6} \cdot 4\frac{2}{5} = \frac{31}{6} \cdot \frac{22}{5} = \frac{31 \cdot 2 \cdot 11}{2 \cdot 3 \cdot 5} = \frac{341}{15} = 22\frac{11}{15}$
22.  $7\frac{3}{8} + 6\frac{3}{4} = \frac{59}{8} + \frac{27}{4} = \frac{59}{8} + \frac{54}{8} = \frac{113}{8} = 14\frac{1}{8}$
23. 
$$\begin{array}{r} 76\frac{1}{12} \\ - 35\frac{1}{4} \\ \hline \end{array} \quad \begin{array}{r} 76\frac{1}{12} \\ - 35\frac{3}{12} \\ \hline \end{array} \quad \begin{array}{r} 75\frac{13}{12} \\ - 35\frac{3}{12} \\ \hline 40\frac{10}{12} = 40\frac{5}{6} \end{array}$$

**Vocabulary, Readiness & Video Check R.2**

1. The number  $\frac{17}{31}$  is called a fraction. The number 31 is called its denominator and 17 is called its numerator.
2. The fraction  $\frac{8}{3}$  is called an improper fraction, the fraction  $\frac{3}{8}$  is called a proper fraction, and  $10\frac{3}{8}$  is called a mixed number.
3. In  $\frac{11}{48}$ , since 11 and 48 have no common factors other than 1,  $\frac{11}{48}$  is in simplest form.
4. Fractions that represent the same portion of a whole are called equivalent fractions.
5. To multiply two fractions, we write  $\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$ .

6. Two numbers are reciprocals of each other if their product is 1.
7. To divide two fractions, we write  $\frac{a}{b} \div \frac{c}{d} = \frac{a \cdot d}{b \cdot c}$ .
8.  $\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$  and  $\frac{a}{b} - \frac{c}{b} = \frac{a-c}{b}$ .
9. The smallest positive number divisible by all the denominators of a list of fractions is called the least common denominator (LCD).
10. The LCD for  $\frac{1}{6}$  and  $\frac{5}{8}$  is 24.
11. The fraction is equal to 1.
12. Equivalent fractions represent the same quantity.
13. wrote both the numerator and denominator as products of prime numbers
14.  $\frac{20}{1}$  or 20
15. When adding or subtraction fractions, we must have common denominators. When multiplying or dividing fractions, we do not.
16. Our original sum,  $4\frac{7}{6}$ , is not in proper form because the fraction part,  $\frac{7}{6}$ , is an improper fraction.
12.  $\frac{2}{3} = \frac{2 \cdot 3}{3 \cdot 3} = \frac{6}{9}$
14.  $\frac{8}{7} = \frac{8 \cdot 8}{7 \cdot 8} = \frac{64}{56}$
16.  $\frac{4}{5} = \frac{4 \cdot 5}{5 \cdot 5} = \frac{20}{25}$
18.  $\frac{3}{6} = \frac{3 \cdot 1}{3 \cdot 2} = \frac{1}{2}$
20.  $\frac{15}{20} = \frac{5 \cdot 3}{5 \cdot 4} = \frac{3}{4}$
22.  $\frac{5}{9}$  cannot be simplified further.
24.  $\frac{42}{45} = \frac{2 \cdot 3 \cdot 7}{3 \cdot 3 \cdot 5} = \frac{14}{15}$
26.  $\frac{8}{40} = \frac{1 \cdot 8}{5 \cdot 8} = \frac{1}{5}$
28.  $\frac{64}{24} = \frac{8 \cdot 8}{3 \cdot 8} = \frac{8}{3}$
30.  $\frac{360}{700} = \frac{18 \cdot 20}{35 \cdot 20} = \frac{18}{35}$
32.  $\frac{455}{525} = \frac{13 \cdot 35}{15 \cdot 35} = \frac{13}{15}$
34.  $\frac{7}{11} \cdot \frac{3}{5} = \frac{7 \cdot 3}{11 \cdot 5} = \frac{21}{55}$
36.  $\frac{7}{8} \cdot \frac{3}{21} = \frac{7 \cdot 3}{8 \cdot 21} = \frac{1 \cdot 7 \cdot 3}{8 \cdot 3 \cdot 7} = \frac{1}{8}$
38.  $\frac{7}{12} \div \frac{1}{2} = \frac{7}{12} \cdot \frac{2}{1} = \frac{7 \cdot 2}{12 \cdot 1} = \frac{7 \cdot 2}{6 \cdot 2} = \frac{7}{6}$
40.  $\frac{3}{5} \div \frac{9}{10} = \frac{3}{5} \cdot \frac{10}{9} = \frac{3 \cdot 10}{5 \cdot 9} = \frac{3 \cdot 2 \cdot 5}{5 \cdot 3 \cdot 3} = \frac{2}{3}$
42.  $2\frac{3}{4} \cdot 1\frac{7}{8} = \frac{11}{4} \cdot \frac{15}{8} = \frac{165}{32} = 5\frac{5}{32}$

## Exercise Set R.2

2.  $\frac{19}{19} = 1$  since  $19 \cdot 1 = 19$ .
4.  $\frac{30}{5} = 6$  since  $5 \cdot 6 = 30$ .
6.  $\frac{21}{1} = 21$  since  $1 \cdot 21 = 21$ .
8.  $\frac{0}{15} = 0$  since  $15 \cdot 0 = 0$ .
10.  $\frac{15}{0}$  is undefined.

$$44. 1\frac{7}{8} \div 3\frac{8}{9} = \frac{15}{8} \div \frac{35}{9} = \frac{15}{8} \cdot \frac{9}{35} = \frac{3 \cdot 5 \cdot 9}{8 \cdot 5 \cdot 7} = \frac{27}{56}$$

$$46. \frac{6}{7} + \frac{1}{7} = \frac{6+1}{7} = \frac{7}{7} = 1$$

$$48. \frac{11}{12} - \frac{1}{16} = \frac{11 \cdot 4}{12 \cdot 4} - \frac{1 \cdot 3}{16 \cdot 3} = \frac{44}{48} - \frac{3}{48} = \frac{44-3}{48} = \frac{41}{48}$$

$$50. \frac{3}{4} + \frac{1}{6} = \frac{3 \cdot 3}{4 \cdot 3} + \frac{1 \cdot 2}{6 \cdot 2} = \frac{9}{12} + \frac{2}{12} = \frac{9+2}{12} = \frac{11}{12}$$

$$52. \frac{11}{7} - \frac{3}{35} = \frac{11 \cdot 5}{7 \cdot 5} - \frac{3}{35} = \frac{55}{35} - \frac{3}{35} = \frac{55-3}{35} = \frac{52}{35}$$

$$54. \begin{array}{r} 5\frac{2}{5} \\ - 3\frac{4}{5} \\ \hline 1\frac{3}{5} \end{array}$$

$$56. \begin{array}{r} 7\frac{3}{20} \\ + 2\frac{13}{15} \\ \hline 9\frac{61}{60} = 9 + 1\frac{1}{60} = 10\frac{1}{60} \end{array}$$

$$58. \frac{13}{132} + \frac{35}{132} = \frac{13+35}{132} = \frac{48}{132} = \frac{4 \cdot 12}{11 \cdot 12} = \frac{4}{11}$$

$$60. \frac{18}{35} - \frac{11}{35} = \frac{18-11}{35} = \frac{7}{35} = \frac{1 \cdot 7}{5 \cdot 7} = \frac{1}{5}$$

$$62. \frac{3}{35} \cdot \frac{10}{63} = \frac{3 \cdot 10}{35 \cdot 63} = \frac{3 \cdot 5 \cdot 2}{7 \cdot 5 \cdot 3 \cdot 21} = \frac{2}{147}$$

$$64. \frac{25}{36} \div 10 = \frac{25}{36} \div \frac{10}{1} = \frac{25}{36} \cdot \frac{1}{10} = \frac{5 \cdot 5 \cdot 1}{36 \cdot 5 \cdot 2} = \frac{5}{72}$$

$$66. \frac{7}{15} - \frac{7}{25} = \frac{7 \cdot 5}{15 \cdot 5} - \frac{7 \cdot 3}{25 \cdot 3} = \frac{35}{75} - \frac{21}{75} = \frac{35-21}{75} = \frac{14}{75}$$

$$68. \begin{aligned} 26\frac{11}{20} + 40\frac{7}{10} &= 26\frac{11}{20} + 40\frac{14}{20} \\ &= 66\frac{25}{20} \\ &= 67\frac{5}{20} \\ &= 67\frac{1}{4} \end{aligned}$$

$$70. 9\frac{5}{6} \div \frac{1}{6} = \frac{59}{6} \div \frac{1}{6} = \frac{59}{6} \cdot \frac{6}{1} = \frac{59 \cdot 6}{6 \cdot 1} = \frac{59}{1} = 59$$

$$72. 6\frac{6}{7} \cdot 3\frac{1}{2} = \frac{48}{7} \cdot \frac{7}{2} = \frac{2 \cdot 24 \cdot 7}{7 \cdot 2} = 24$$

$$74. 2 - \frac{3}{8} = \frac{2}{1} \cdot \frac{8}{8} - \frac{3}{8} = \frac{16}{8} - \frac{3}{8} = \frac{13}{8}$$

$$76. \begin{array}{r} 4\frac{7}{8} \\ - 2\frac{3}{16} \\ \hline 2\frac{11}{16} \end{array}$$

$$78. \begin{aligned} \frac{8}{11} - \frac{1}{4} + \frac{1}{2} &= \frac{8 \cdot 4}{11 \cdot 4} - \frac{1 \cdot 11}{4 \cdot 11} + \frac{1 \cdot 22}{2 \cdot 22} \\ &= \frac{32}{44} - \frac{11}{44} + \frac{22}{44} \\ &= \frac{32-11+22}{44} \\ &= \frac{43}{44} \end{aligned}$$

80. The work is correct.

82. The work is incorrect.

$$\frac{16}{28} = \frac{2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 7} = \frac{4}{7}$$

84. answers may vary

$$\begin{aligned}
 86. \quad 1 - \frac{1}{4} - \frac{3}{8} &= \frac{8}{8} - \frac{1 \cdot 2}{4 \cdot 2} - \frac{3}{8} \\
 &= \frac{8}{8} - \frac{2}{8} - \frac{3}{8} \\
 &= \frac{8-2-3}{8} \\
 &= \frac{3}{8}
 \end{aligned}$$

The unknown part is  $\frac{3}{8}$ .

$$\begin{aligned}
 88. \quad 1 - \frac{3}{10} - \frac{5}{10} &= \frac{10}{10} - \frac{3}{10} - \frac{5}{10} \\
 &= \frac{10-3-5}{10} \\
 &= \frac{2}{10} \\
 &= \frac{1 \cdot 2}{5 \cdot 2} \\
 &= \frac{1}{5}
 \end{aligned}$$

The unknown part is  $\frac{1}{5}$ .

$$\begin{array}{r}
 90. \quad 43 \qquad 42\frac{8}{8} \\
 - 41\frac{5}{8} \quad - 41\frac{5}{8} \\
 \hline \qquad \qquad 1\frac{3}{8}
 \end{array}$$

The short crutch should be lengthened by  $1\frac{3}{8}$  inches.

92. The piece representing engineering is labeled  $\frac{10}{100}$ .
- $$\frac{10}{100} = \frac{10 \cdot 1}{10 \cdot 10} = \frac{1}{10}$$
- $\frac{1}{10}$  of entering college freshmen plan to major in engineering.

94. answers may vary

96. The piece representing National Parks is labeled  $\frac{16}{100}$ .

$$\frac{16}{100} = \frac{4 \cdot 4}{4 \cdot 25} = \frac{4}{25}$$

$\frac{4}{25}$  of National Park Service areas are National Parks.

98. answers may vary

$$\begin{aligned}
 100. \quad A &= \frac{1}{2}bh \\
 &= \frac{1}{2} \cdot \frac{7}{8} \cdot \frac{4}{9} \\
 &= \frac{1 \cdot 7 \cdot 4}{2 \cdot 8 \cdot 9} \\
 &= \frac{1 \cdot 7 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3} \\
 &= \frac{7}{36}
 \end{aligned}$$

The area is  $\frac{7}{36}$  square foot.

### Section R.3 Practice Exercises

$$1. \quad 0.27 = \frac{27}{100}$$

$$2. \quad 5.1 = \frac{51}{10}$$

$$3. \quad 7.685 = \frac{7685}{1000}$$

$$\begin{array}{r}
 4. \quad \text{a.} \quad 7.19 \\
 19.782 \\
 + 1.006 \\
 \hline
 27.978
 \end{array}$$

$$\begin{array}{r}
 \text{b.} \quad 12. \\
 0.79 \\
 + 0.03 \\
 \hline
 12.82
 \end{array}$$

$$\begin{array}{r}
 5. \quad \text{a.} \quad 84.230 \\
 - 26.982 \\
 \hline
 57.248
 \end{array}$$

$$\begin{array}{r}
 \text{b.} \quad 90.00 \\
 - 0.19 \\
 \hline
 89.81
 \end{array}$$

$$\begin{array}{r} 6. \text{ a. } \quad 0.31 \\ \times 4.6 \\ \hline 186 \\ 124 \\ \hline 1.426 \end{array}$$

$$\begin{array}{r} \text{b. } \quad 1.26 \\ \times 0.03 \\ \hline 0.0378 \end{array}$$

$$\begin{array}{r} 7. \text{ a. } \quad 43.5 \\ 0.5 \overline{) 21.75} \\ \underline{-20} \phantom{0} \\ 17 \\ \underline{-15} \phantom{0} \\ 25 \\ \underline{-25} \\ 0 \end{array}$$

$$\begin{array}{r} \text{b. } \quad 2600 \\ 0.006 \overline{) 15.600} \\ \underline{-12} \phantom{00} \\ 36 \\ \underline{-36} \\ 0 \end{array}$$

8. 12.9187 rounded to the nearest hundredth is 12.92.

9. 245.348 rounded to the nearest tenth is 245.3.

$$\begin{array}{r} 10. \quad 0.4 \\ 5 \overline{) 2.0} \\ \underline{-20} \\ 0 \end{array}$$

$$\frac{2}{5} = 0.4$$

$$\begin{array}{r} 11. \quad 0.833 \\ 6 \overline{) 5.000} \\ \underline{-48} \phantom{00} \\ 20 \\ \underline{-18} \phantom{00} \\ 20 \\ \underline{-18} \phantom{00} \\ 2 \end{array}$$

$$\frac{5}{6} = 0.833\ldots = 0.8\bar{3}$$

$$\begin{array}{r} 12. \quad 0.1111 \\ 9 \overline{) 1.0000} \\ \underline{-9} \phantom{0000} \\ 10 \\ \underline{-9} \phantom{0000} \\ 10 \\ \underline{-9} \phantom{0000} \\ 10 \\ \underline{-9} \phantom{0000} \\ 1 \end{array}$$

$$\frac{1}{9} = 0.1111\ldots \approx 0.111$$

$$13. \text{ a. } \quad 20\% = \underline{20}\% = 0.20$$

$$\text{b. } \quad 1.2\% = \underline{01.2}\% = 0.012$$

$$\text{c. } \quad 465\% = \underline{465}\% = 4.65$$

$$14. \text{ a. } \quad 0.42 = \underline{0.42} = 42\%$$

$$\text{b. } \quad 0.003 = \underline{0.003} = 0.3\%$$

$$\text{c. } \quad 2.36 = \underline{2.36} = 236\%$$

$$\text{d. } \quad 0.7 = \underline{0.70} = 70\%$$

### Vocabulary, Readiness & Video Check R.3

1. Like fractional notation, decimal notation is used to denote a part of a whole.
2. To write fractions as decimals, divide the numerator by the denominator.
3. To add or subtract decimals, write the decimals so that the decimal points line up vertically.
4. When multiplying decimals, the decimal point in the product is placed so that the number of decimal places in the product is equal to the sum of the number of decimal places in the factors.
5. Percent means “per hundred.”
6. 100% = 1
7. The % symbol is read as percent.
8. To write a percent as a *decimal*, drop the % symbol and move the decimal point two places to the left.

9. To write a decimal as a *percent*, move the decimal point two places to the right and attach the % symbol.
10. Reading a decimal correctly gives us the correct place value, which tells us the denominator of our equivalent fraction.
11. When adding or subtracting decimal numbers, we do line up decimal points. When multiplying decimal numbers, we do not need to line up decimal points.
12. when rounding whole numbers, digits to the right of the rounding place are replaced by zeros; when rounding decimal numbers to the right of the decimal point, digits to the right of the rounding place are not replaced by zeros
13. To write a fraction as a decimal, we divide the numerator by the denominator.
14. 1

## Exercise Set R.3

2.  $0.9 = \frac{9}{10}$
4.  $7.23 = \frac{723}{100}$
6.  $0.239 = \frac{239}{1000}$
8.  $892.7 = \frac{8927}{10}$
10. 
$$\begin{array}{r} 2.31 \\ + 6.4 \\ \hline 8.71 \end{array}$$
12. 
$$\begin{array}{r} 32.4 \\ 1.58 \\ + 0.0934 \\ \hline 34.0734 \end{array}$$
14. 
$$\begin{array}{r} 7.6 \\ - 2.1 \\ \hline 5.5 \end{array}$$

16. 
$$\begin{array}{r} 28.00 \\ - 3.31 \\ \hline 24.69 \end{array}$$
18. 
$$\begin{array}{r} 0.7 \\ \times 0.9 \\ \hline 0.63 \end{array}$$
20. 
$$\begin{array}{r} 0.079 \\ \times 3.6 \\ \hline 474 \\ 237 \\ \hline 0.2844 \end{array}$$
22. 
$$\begin{array}{r} 5.85 \\ 2 \overline{) 11.70} \\ \underline{-10} \phantom{0} \\ 17 \\ \underline{-16} \phantom{0} \\ 10 \\ \underline{-10} \\ 0 \end{array}$$
24. 
$$\begin{array}{r} 3.6 \\ 0.92 \overline{) 3.312} \\ \underline{-276} \phantom{0} \\ 552 \\ \underline{-552} \\ 0 \end{array}$$
26. 
$$\begin{array}{r} 65.0028 \\ 5.0903 \\ + 6.9 \\ \hline 76.9931 \end{array}$$
28. 
$$\begin{array}{r} 8.91 \\ \times 100 \\ \hline 891 \end{array}$$
30. 
$$\begin{array}{r} 40. \\ 0.9 \overline{) 36.0} \\ \underline{-36} \phantom{0} \\ 00 \end{array}$$
32. 
$$\begin{array}{r} 863.20 \\ - 39.45 \\ \hline 823.75 \end{array}$$



$$\begin{array}{r}
 34. \quad 8.03 \\
 \times 5.5 \\
 \hline
 4015 \\
 4015 \\
 \hline
 44.165
 \end{array}$$

$$\begin{array}{r}
 36. \quad 0.054 \overline{) 51.840} \\
 \underline{-486} \phantom{0} \\
 324 \\
 \underline{-324} \\
 00
 \end{array}$$

$$\begin{array}{r}
 38. \quad 31.006 \\
 \times 3.71 \\
 \hline
 31006 \\
 217042 \\
 + 93018 \\
 \hline
 115.03226
 \end{array}$$

40. 0.75 rounded to the nearest tenth is 0.8.

42. 0.452 rounded to the nearest hundredth is 0.45.

44. 63.4529 rounded to the nearest thousandth is 63.453.

46. 68,936.543 rounded to the nearest tenth is 68,936.5.

48. 42.9878 rounded to the nearest thousandth is 42.988.

50.  $\frac{9}{25} = \frac{9 \cdot 4}{25 \cdot 4} = \frac{36}{100} = 0.36$

$$\begin{array}{r}
 52. \quad 9 \overline{) 7.000} \\
 \underline{-63} \phantom{0} \\
 70 \\
 \underline{-63} \phantom{0} \\
 70 \\
 \underline{-63} \\
 7
 \end{array}$$

$$\frac{7}{9} = 0.\overline{7} \approx 0.78$$

54.  $\frac{5}{8} = \frac{5 \cdot 125}{8 \cdot 125} = \frac{625}{1000} = 0.625$

$$\begin{array}{r}
 56. \quad 6 \overline{) 1.000} \\
 \underline{-6} \phantom{00} \\
 40 \\
 \underline{-36} \phantom{0} \\
 40 \\
 \underline{-36} \phantom{0} \\
 4
 \end{array}$$

$$\frac{1}{6} = 0.1\overline{6} \approx 0.17$$

$$\begin{array}{r}
 58. \quad 9 \overline{) 34.00} \\
 \underline{-27} \phantom{00} \\
 70 \\
 \underline{-63} \phantom{0} \\
 70 \\
 \underline{-63} \\
 7
 \end{array}$$

$$\frac{34}{9} = 3.\overline{7} \approx 3.78$$

60. 36% = 0.36

62. 2.2% = 0.022

64. 417% = 4.17

66. 700% = 7.00 or 7

68. 81.49% = 0.8149

70. 0.6% = 0.006

72. 73.2% = 0.732

74. 0.32 = 32%

76. 0.521 = 52.1%

78. 3 = 3.00 = 300%

80. 0.1 = 10%

82. 2.15 = 215%

84. 0.005 = 0.5%

86. 0.142 = 14.2%

88. 11% = 0.11

$$11\% = \frac{11}{100}$$

90.  $60.6\% = 0.606$

$$60.6\% = \frac{60.6}{100} = \frac{606}{1000} = \frac{303}{500}$$

92. The two digits 67 repeat in  $\overline{0.67}$ , so the choice is c.  $0.6767\ldots$ 

94. answers may vary

96. 213.4

30.8

+ 4.4

---

248.6

The total amount consumed is 248.6 pounds.

98. a. 0.5269% rounded to the nearest tenth percent is 0.5%.

b. 0.5269% rounded to the nearest hundredth percent is 0.53%.

100. a.  $0.231 = 23.1\%$

b.  $5.12 = 512\% \neq 0.0512\%$

c.  $3.2 = 320\%$

d.  $0.0175 = 1.75\% \neq 0.175\%$

a and c are correct.

102.  $45\% + 30\% + 20\% = 95\%$

$100\% - 95\% = 5\%$

The missing percent is 5%.

104. The second longest bar corresponds to personal and home care aides, so that is predicted to be the second fastest growing occupation.

106.  $40\% = 0.40$

108. answers may vary

**Chapter R Vocabulary Check**

- To factor means to write as a product.
- A multiple of a number is the product of that number and any natural number.
- A composite number is a natural number greater than 1 that is not prime.
- The word percent means per 100.

5. Fractions that represent the same portion of a whole are called equivalent fractions.6. An improper fraction is a fraction whose numerator is greater than or equal to its denominator.7. A prime number is a natural number greater than 1 whose only factors are 1 and itself.8. A fraction is simplified when the numerator and the denominator have no factors in common other than 1.9. A proper fraction is one whose numerator is less than its denominator.10. A mixed number contains a whole number part and a fraction part.**Chapter R Review**

1.  $42 = 2 \cdot 21 = 2 \cdot 3 \cdot 7$

$$\begin{aligned}
 2. \quad 800 &= 2 \cdot 400 \\
 &= 2 \cdot 2 \cdot 200 \\
 &= 2 \cdot 2 \cdot 2 \cdot 100 \\
 &= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 50 \\
 &= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 25 \\
 &= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 5 \cdot 5
 \end{aligned}$$

$$\begin{aligned}
 3. \quad 12 &= 2 \cdot 2 \cdot 3 \\
 30 &= 2 \cdot 3 \cdot 5 \\
 \text{LCM} &= 2 \cdot 2 \cdot 3 \cdot 5 = 60
 \end{aligned}$$

$$\begin{aligned}
 4. \quad 7 &= 7 \\
 42 &= 2 \cdot 3 \cdot 7 \\
 \text{LCM} &= 2 \cdot 3 \cdot 7 = 42
 \end{aligned}$$

$$\begin{aligned}
 5. \quad 4 &= 2 \cdot 2 \\
 6 &= 2 \cdot 3 \\
 10 &= 2 \cdot 5 \\
 \text{LCM} &= 2 \cdot 2 \cdot 3 \cdot 5 = 60
 \end{aligned}$$

$$\begin{aligned}
 6. \quad 2 &= 2 \\
 5 &= 5 \\
 7 &= 7 \\
 \text{LCM} &= 2 \cdot 5 \cdot 7 = 70
 \end{aligned}$$

7.  $\frac{5}{8} = \frac{5 \cdot 3}{8 \cdot 3} = \frac{15}{24}$

8.  $\frac{2}{3} = \frac{2 \cdot 20}{3 \cdot 20} = \frac{40}{60}$

$$9. \frac{8}{20} = \frac{2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 5} = \frac{2}{5}$$

$$10. \frac{15}{100} = \frac{3 \cdot 5}{2 \cdot 2 \cdot 5 \cdot 5} = \frac{3}{20}$$

$$11. \frac{12}{6} = \frac{2 \cdot 6}{6} = 2$$

$$12. \frac{8}{8} = 1$$

$$13. \frac{1}{7} \cdot \frac{8}{11} = \frac{1 \cdot 8}{7 \cdot 11} = \frac{8}{77}$$

$$\begin{aligned} 14. \frac{5}{12} + \frac{2}{15} &= \frac{5 \cdot 5}{12 \cdot 5} + \frac{2 \cdot 4}{15 \cdot 4} \\ &= \frac{25}{60} + \frac{8}{60} \\ &= \frac{25+8}{60} \\ &= \frac{33}{60} \\ &= \frac{11 \cdot 3}{20 \cdot 3} \\ &= \frac{11}{20} \end{aligned}$$

$$15. \frac{3}{10} \div 6 = \frac{3}{10} \div \frac{6}{1} = \frac{3}{10} \cdot \frac{1}{6} = \frac{3 \cdot 1}{10 \cdot 6} = \frac{3 \cdot 1}{10 \cdot 2 \cdot 3} = \frac{1}{20}$$

$$16. \frac{7}{9} - \frac{1}{6} = \frac{7 \cdot 2}{9 \cdot 2} - \frac{1 \cdot 3}{6 \cdot 3} = \frac{14}{18} - \frac{3}{18} = \frac{14-3}{18} = \frac{11}{18}$$

$$17. 3\frac{3}{8} \cdot 4\frac{1}{4} = \frac{27}{8} \cdot \frac{17}{4} = \frac{27 \cdot 17}{8 \cdot 4} = \frac{459}{32} = 14\frac{11}{32}$$

$$18. 2\frac{1}{3} - 1\frac{5}{6} = \frac{7}{3} - \frac{11}{6} = \frac{14}{6} - \frac{11}{6} = \frac{14-11}{6} = \frac{3}{6} = \frac{1}{2}$$

$$\begin{array}{r} 19. \quad 16\frac{9}{10} \quad 16\frac{27}{30} \\ \quad + 3\frac{2}{3} \quad + 3\frac{20}{30} \\ \hline \quad \quad 19\frac{47}{30} = 19 + 1\frac{17}{30} = 20\frac{17}{30} \end{array}$$

$$\begin{aligned} 20. \quad 6\frac{2}{7} \div 2\frac{1}{5} &= \frac{44}{7} \div \frac{11}{5} \\ &= \frac{44}{7} \cdot \frac{5}{11} \\ &= \frac{44 \cdot 5}{7 \cdot 11} \\ &= \frac{4 \cdot 11 \cdot 5}{7 \cdot 11} \\ &= \frac{20}{7} \\ &= 2\frac{6}{7} \end{aligned}$$

$$21. \quad A = lw = \frac{11}{12} \cdot \frac{3}{5} = \frac{11 \cdot 3}{12 \cdot 5} = \frac{11 \cdot 3}{3 \cdot 4 \cdot 5} = \frac{11}{20}$$

The area is  $\frac{11}{20}$  square mile.

$$22. \quad A = \frac{1}{2}bh = \frac{1}{2} \cdot \frac{5}{4} \cdot \frac{1}{2} = \frac{1 \cdot 5 \cdot 1}{2 \cdot 4 \cdot 2} = \frac{5}{16}$$

The area is  $\frac{5}{16}$  square meter.

$$23. \quad 1.81 = \frac{181}{100}$$

$$24. \quad 0.035 = \frac{35}{1000}$$

$$\begin{array}{r} 25. \quad 76.358 \\ + 18.76 \\ \hline 95.118 \end{array}$$

$$\begin{array}{r} 26. \quad 35 \\ \quad 0.02 \\ + 1.765 \\ \hline 36.785 \end{array}$$

$$\begin{array}{r} 27. \quad 18.00 \\ \quad - 4.62 \\ \hline 13.38 \end{array}$$

$$\begin{array}{r} 28. \quad 804.062 \\ \quad - 112.489 \\ \hline 691.573 \end{array}$$

$$\begin{array}{r} 29. \quad 7.6 \\ \times 12 \\ \hline 152 \\ 76 \phantom{0} \\ \hline 91.2 \end{array}$$

$$\begin{array}{r} 30. \quad 14.63 \\ \times 3.2 \\ \hline 2926 \\ 4389 \phantom{0} \\ \hline 46.816 \end{array}$$

$$\begin{array}{r} 31. \quad 27 \overline{) 772.2} \\ \underline{-54} \phantom{00} \\ 232 \phantom{0} \\ \underline{-216} \phantom{0} \\ 162 \phantom{0} \\ \underline{-162} \phantom{0} \\ 0 \end{array}$$

$$\begin{array}{r} 32. \quad 0.06 \overline{) 13.80} \\ \underline{-12} \phantom{00} \\ 18 \phantom{0} \\ \underline{-18} \phantom{0} \\ 00 \end{array}$$

33. 0.7652 rounded to the nearest hundredth is 0.77.

34. 25.6293 rounded to the nearest tenth is 25.6.

$$35. \quad \frac{1}{2} = \frac{1 \cdot 5}{2 \cdot 5} = \frac{5}{10} = 0.5$$

$$36. \quad \frac{3}{8} = \frac{3 \cdot 125}{8 \cdot 125} = \frac{375}{1000} = 0.375$$

$$\begin{array}{r} 37. \quad 11 \overline{) 4.0000} \\ \underline{-33} \phantom{00} \\ 70 \phantom{0} \\ \underline{-66} \phantom{0} \\ 40 \phantom{0} \\ \underline{-33} \phantom{0} \\ 70 \phantom{0} \\ \underline{-66} \phantom{0} \\ 4 \phantom{0} \end{array}$$

$$\frac{4}{11} = 0.\overline{36} \approx 0.364$$

$$\begin{array}{r} 38. \quad 6 \overline{) 5.000} \\ \underline{-48} \phantom{00} \\ 20 \phantom{0} \\ \underline{-18} \phantom{0} \\ 20 \phantom{0} \\ \underline{-18} \phantom{0} \\ 2 \phantom{0} \end{array}$$

$$\frac{5}{6} = 0.8\overline{3} \approx 0.833$$

$$39. \quad 29\% = 0.29$$

$$40. \quad 1.4\% = 0.014$$

$$41. \quad 0.39 = 39\%$$

$$42. \quad 1.2 = 120\%$$

$$43. \quad 68.3\% = 0.683$$

The decimal is 0.683.

$$44. \quad 2.3\% = 0.023$$

$$5 = 500\%$$

$$40\% = 0.4$$

The true statement is b.

### Chapter R Test

$$\begin{array}{r} 1. \quad 3 \overline{) 9} \\ 2 \overline{) 18} \\ 2 \overline{) 36} \\ 2 \overline{) 72} \end{array}$$

The prime factorization of 72 is  $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$ .

$$\begin{aligned}
 2. \quad 5 &= 5 \\
 18 &= 2 \cdot 3 \cdot 3 \\
 20 &= 2 \cdot 2 \cdot 5 \\
 \text{LCM} &= 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5 = 180
 \end{aligned}$$

$$3. \quad \frac{5}{12} = \frac{5 \cdot 5}{12 \cdot 5} = \frac{25}{60}$$

$$4. \quad \frac{15}{20} = \frac{3 \cdot 5}{4 \cdot 5} = \frac{3}{4}$$

$$5. \quad \frac{48}{100} = \frac{4 \cdot 12}{4 \cdot 25} = \frac{12}{25}$$

$$6. \quad 1.3 = 1\frac{3}{10} = \frac{13}{10}$$

$$7. \quad \frac{5}{8} + \frac{7}{10} = \frac{5 \cdot 5}{8 \cdot 5} + \frac{7 \cdot 4}{10 \cdot 4} = \frac{25}{40} + \frac{28}{40} = \frac{25+28}{40} = \frac{53}{40}$$

$$8. \quad \frac{2}{3} \cdot \frac{27}{49} = \frac{2 \cdot 27}{3 \cdot 49} = \frac{2 \cdot 3 \cdot 9}{3 \cdot 49} = \frac{18}{49}$$

$$\begin{aligned}
 9. \quad \frac{9}{10} \div 18 &= \frac{9}{10} \div \frac{18}{1} \\
 &= \frac{9}{10} \cdot \frac{1}{18} \\
 &= \frac{9 \cdot 1}{10 \cdot 18} \\
 &= \frac{9 \cdot 1}{10 \cdot 9 \cdot 2} \\
 &= \frac{1}{20}
 \end{aligned}$$

$$10. \quad \frac{8}{9} - \frac{1}{12} = \frac{8 \cdot 4}{9 \cdot 4} - \frac{1 \cdot 3}{12 \cdot 3} = \frac{32}{36} - \frac{3}{36} = \frac{32-3}{36} = \frac{29}{36}$$

$$11. \quad 1\frac{2}{9} + 3\frac{2}{3} = \frac{11}{9} + \frac{11}{3} = \frac{11}{9} + \frac{33}{9} = \frac{11+33}{9} = \frac{44}{9} = 4\frac{8}{9}$$

$$\begin{array}{r}
 12. \quad 5\frac{6}{11} \quad 5\frac{12}{22} \\
 -3\frac{7}{22} \quad -3\frac{7}{22} \\
 \hline
 \quad \quad 2\frac{5}{22}
 \end{array}$$

$$13. \quad 6\frac{7}{8} \div \frac{1}{8} = \frac{55}{8} \div \frac{1}{8} = \frac{55}{8} \cdot \frac{8}{1} = \frac{55 \cdot 8}{8 \cdot 1} = \frac{55}{1} = 55$$

$$14. \quad 2\frac{1}{10} \cdot 6\frac{1}{2} = \frac{21}{10} \cdot \frac{13}{2} = \frac{21 \cdot 13}{10 \cdot 2} = \frac{273}{20} = 13\frac{13}{20}$$

$$\begin{array}{r}
 15. \quad 43 \\
 0.21 \\
 + 1.9 \\
 \hline
 45.11
 \end{array}$$

$$\begin{array}{r}
 16. \quad 123.60 \\
 - 57.72 \\
 \hline
 65.88
 \end{array}$$

$$\begin{array}{r}
 17. \quad 7.93 \\
 \times 1.6 \\
 \hline
 4758 \\
 793 \\
 \hline
 12.688
 \end{array}$$

$$\begin{array}{r}
 18. \quad 0.25 \overline{) 80.00} \\
 \underline{-75} \phantom{00} \\
 50 \\
 \underline{-50} \\
 00
 \end{array}$$

$$19. \quad 23.7272 \text{ rounded to the nearest hundredth is } 23.73.$$

$$20. \quad \frac{7}{8} = \frac{7 \cdot 125}{8 \cdot 125} = \frac{875}{1000} = 0.875$$

$$\begin{array}{r}
 21. \quad 0.166... \\
 6 \overline{) 1.000} \\
 \underline{-6} \phantom{00} \\
 40 \\
 \underline{-36} \\
 40 \\
 \underline{-36} \\
 4
 \end{array}$$

$$\frac{1}{6} = 0.1\overline{6} \approx 0.167$$

$$22. \quad 63.2\% = 0.632$$

$$23. \quad 0.09 = 9\%$$

$$24. \quad \frac{3}{4} = \frac{3 \cdot 25}{4 \cdot 25} = \frac{75}{100} = 0.75 = 75\%$$

25.  $\frac{3}{4}$  of the fresh water is icecaps and glaciers.

26.  $\frac{1}{200}$  of the fresh water is active water.

$$\begin{aligned} 27. \quad 1 - \frac{3}{4} - \frac{1}{200} &= \frac{200}{200} - \frac{150}{200} - \frac{1}{200} \\ &= \frac{200 - 150 - 1}{200} \\ &= \frac{49}{200} \end{aligned}$$

$\frac{49}{200}$  of the fresh water is groundwater.

$$\begin{aligned} 28. \quad 1 - \frac{1}{200} &= \frac{200}{200} - \frac{1}{200} = \frac{200 - 1}{200} = \frac{199}{200} \\ \frac{199}{200} &\text{ of the fresh water is groundwater or} \\ &\text{icecaps and glaciers.} \end{aligned}$$

$$\begin{aligned} 29. \quad \text{Area} &= \frac{1}{2}(\text{base})(\text{height}) \\ &= \frac{1}{2} \cdot \frac{3}{4} \cdot \frac{1}{3} \\ &= \frac{1 \cdot 3 \cdot 1}{2 \cdot 4 \cdot 3} \\ &= \frac{1}{8} \end{aligned}$$

The area is  $\frac{1}{8}$  square foot.

$$30. \quad A = lw = \frac{9}{8} \cdot \frac{7}{8} = \frac{9 \cdot 7}{8 \cdot 8} = \frac{63}{64}$$

The area is  $\frac{63}{64}$  square centimeter.