



# Study Guide

## Solving Addition and Subtraction Equations

Remember, equations must always remain balanced. If you add the same number to each side of an equation, the two sides remain equal.

**Example 1** Solve  $t - 12.2 = 15.3$ . Check your solution.

$$t - 12.2 + 12.2 = 15.3 + 12.2 \quad \text{Add 12.2 to each side of the equation.}$$

$$t = 27.5$$

**Check:**  $t - 12.2 = 15.3$

$$27.5 - 12.2 \stackrel{?}{=} 15.3$$

$$15.3 = 15.3 \quad \checkmark$$

Replace  $t$  with 27.5.

If you subtract the same number from each side of an equation, the two sides remain equal.

**Example 2** Solve  $5\frac{2}{5} + v = 7\frac{1}{2}$ . Check your solution.

$$5\frac{2}{5} - 5\frac{2}{5} + v = 7\frac{1}{2} - 5\frac{2}{5} \quad \text{Subtract } 5\frac{2}{5} \text{ from each side of the equation.}$$

$$v = 7\frac{5}{10} - 5\frac{4}{10}$$

$$v = 2\frac{1}{10}$$

**Check:**  $5\frac{2}{5} + v = 7\frac{1}{2}$

$$5\frac{2}{5} + 2\frac{1}{10} \stackrel{?}{=} 7\frac{1}{2}$$

$$5\frac{4}{10} + 2\frac{1}{10} \stackrel{?}{=} 7\frac{1}{2}$$

$$7\frac{5}{10} \stackrel{?}{=} 7\frac{1}{2}$$

$$7\frac{1}{2} = 7\frac{1}{2} \quad \checkmark$$

Replace  $v$  with  $2\frac{1}{10}$ .

**Solve each equation. Check your solution.**

1.  $17 + k = 62$

2.  $j - 4.5 = 1.7$

3.  $8.9 = p - 3.3$

4.  $n + 2\frac{1}{3} = 4\frac{2}{3}$

5.  $17.2 = h + 4.9$

6.  $y - 9 = 29$

7.  $133 = v + 70$

8.  $x - 7\frac{1}{2} = 15$

9.  $146 + j = 199$

10.  $m - 9.4 = 15.7$

11.  $89.6 = c + 62.2$

12.  $f - 19 = 77$



# Study Guide

## Solving Multiplication Equations

If you divide each side of an equation by the same nonzero number, the two sides remain equal.

**Example 1** Solve  $48.6 = 6c$ . Check your solution.

$$\frac{48.6}{6} = \frac{6c}{6}$$

$$8.1 = c$$

*Divide each side of the equation by 6.*

**Check:**  $48.6 = 6c$

$$48.6 \stackrel{?}{=} 6 \times 8.1$$

$$48.6 = 48.6 \quad \checkmark$$

*Replace  $c$  with 8.1.*

If you multiply each side of an equation by the same number, the two sides remain equal.

**Example 2** Solve  $\frac{w}{5} = 2.3$ . Check your solution.

$$\frac{w}{5} \cdot 5 = 2.3 \times 5$$

$$w = 11.5$$

*Multiply each side of the equation by 5.*

**Check:**  $\frac{w}{5} = 2.3$

$$\frac{11.5}{5} \stackrel{?}{=} 2.3$$

$$2.3 = 2.3 \quad \checkmark$$

*Replace  $w$  with 11.5.*

**Solve each equation. Check your solution.**

1.  $5r = 45$

2.  $\frac{y}{7} = 3.5$

3.  $180 = 9v$

4.  $21 = \frac{n}{3}$

5.  $\frac{1}{5}x = 4$

6.  $\frac{f}{1.1} = 7$

7.  $\frac{1}{2} = \frac{1}{8} \cdot c$

8.  $17v = 289$

9.  $3.5 = \frac{m}{4}$

10.  $\frac{y}{5} = 2.4$

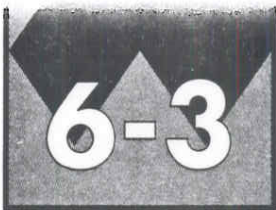
11.  $5.1p = 61.2$

12.  $0.6 = \frac{a}{9}$

13.  $\frac{x}{10} = 4.9$

14.  $6.4t = 64$

15.  $\frac{s}{8} = 9.6$



# Study Guide

## Solving Two-Step Equations

To solve two-step equations, you need to add or subtract first. You also need to multiply or divide.

**Examples** 1 Solve  $7v - 3 = 25$ .

$$7v - 3 = 25$$

$$7v - 3 + 3 = 25 + 3$$

*Add 3 to each side of the equation.*

$$7v = 28$$

$$\frac{7v}{7} = \frac{28}{7}$$

*Divide each side of the equation by 7.*

$$v = 4$$

2 Solve  $\frac{1}{6}(r - 3) = -5$ .

$$\frac{1}{6}(r - 3) = -5$$

$$6 \times \frac{1}{6}(r - 3) = 6(-5)$$

*Multiply each side by 6.*

$$r - 3 = -30$$

$$r - 3 + 3 = -30 + 3$$

*Add 3 to each side of the equation.*

$$r = -27$$

**Solve each equation. Check your solution.**

1.  $\frac{1}{3}(s + 6) = 3$

2.  $\frac{1}{5}(t - 2) = 0$

3.  $\frac{2}{3}(a - 18) = -6$

4.  $12 - 4n = 4$

5.  $7 + \frac{k}{4} = 9$

6.  $\frac{1}{2}y - 7 = -9$

7.  $\frac{2}{3}(b + 6) = -2$

8.  $\frac{3}{8}(c + 8) = -\frac{3}{2}$

9.  $\frac{5}{7}(d + 20) = -10$

10.  $14 + \frac{t}{5} = 10$

11.  $\frac{-h}{6} + 1 = -1$

12.  $-5t - 5 = -5$



# Study Guide

## Writing Expressions and Equations

The table below shows phrases written as mathematical expressions.

Phrases	Expression	Phrases	Expression
9 more than a number the sum of 9 and a number a number plus 9 a number increased by 9 the total of $x$ and 9	$x + 9$	4 subtracted from a number a number minus 4 4 less than a number a number decreased by 4 the difference of $h$ and 4	$h - 4$
Phrases	Expression	Phrases	Expression
6 multiplied by $g$ 6 times a number the product of $g$ and 6	$6g$	a number divided by 5 the quotient of $t$ and 5 divide a number by 5	$\frac{t}{5}$

The table below shows sentences written as an equation.

Sentences	Equation
Sixty less than three times the amount is \$59. Three times the amount less 60 is equal to 59. 59 is equal to 60 subtracted from three times a number. A number times three minus 60 equals 59.	$3n - 60 = 59$

**Write each phrase as an algebraic expression.**

- 7 less than  $m$
- the quotient of 3 and  $y$
- the total of 5 and  $c$
- the difference of 6 and  $r$
- $n$  divided by 2
- the product of  $k$  and 9

**Write each sentence as an algebraic equation.**

- A number increased by 7 is 11.
- The price decreased by \$4 is \$29.
- Twice as many points as Bob would be 18 points.
- After dividing the money 5 ways, each person got \$67.
- Three more than 8 times as many trees is 75 trees.
- Seven less than a number is 15.



# 6-5

## Study Guide

### Inequalities

An inequality is a mathematical sentence that contains the symbols  $<$ ,  $>$ ,  $\leq$ , or  $\geq$ .

Words	Symbols
$m$ is greater than 7.	$m > 7$
$r$ is less than $-4$ .	$r < -4$
$t$ is greater than or equal to 6.	$t \geq 6$
$y$ is less than or equal to 1.	$y \leq 1$

Solve inequalities just like you solve equations.  
You can use a number line to show solutions to inequalities.

**Examples** 1 Solve  $v + 3 < 5$ .

Then graph the solution.

$$\begin{aligned} v + 3 &< 5 \\ v + 3 - 3 &< 5 - 3 \\ v &< 2 \end{aligned}$$

This point is not included.

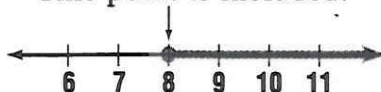


2 Solve  $\frac{k}{4} \geq 2$ .

Then graph the solution.

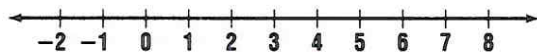
$$\begin{aligned} \frac{k}{4} &\geq 2 \\ \frac{k}{4} \times 4 &\geq 2 \times 4 \\ k &\geq 8 \end{aligned}$$

This point is included.

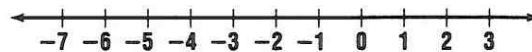


Solve each inequality. Graph the solution on the number line.

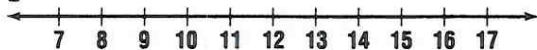
1.  $c - 1 < 4$



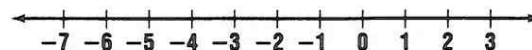
2.  $4 + t > -1$



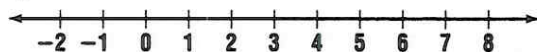
3.  $\frac{r}{2} > 5$



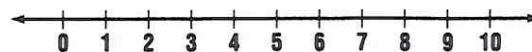
4.  $3w < -3$



5.  $2p \geq 6$



6.  $v - 4 \leq 3$





# Study Guide

## Functions and Graphs

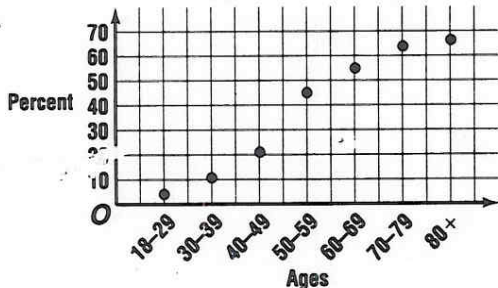
The table at the right shows the risk of high blood pressure for people in seven different age groups.

- Graph the ordered pairs (age, percentage).
- Describe how the risk of high blood pressure is related to age.
- When is the increase the greatest?

Age	Americans with High Blood Pressure
18-29	4%
30-39	11%
40-49	21%
50-59	44%
60-69	54%
70-79	64%
80+	65%

Source: Archives of Internal Medicine, 1993

a.



b. The risk of high blood pressure increases as you age.

c. The risk increases greatly once a person reaches the 50-59 age bracket.

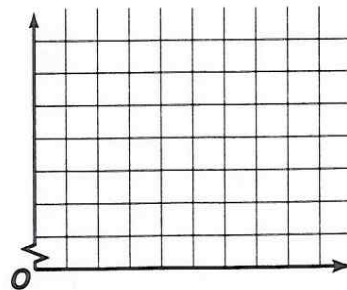
### Solve.

1. The table below shows the number of adult memberships at sport clubs.

- Graph the ordered pairs (year, memberships) on the coordinate plane.
- Write a statement that describes the trend in memberships.

Year	Memberships (in millions)
1987	14
1989	16
1991	16
1993	18
1995	19

Source: International Health, Racquet, and Sportsclub Association

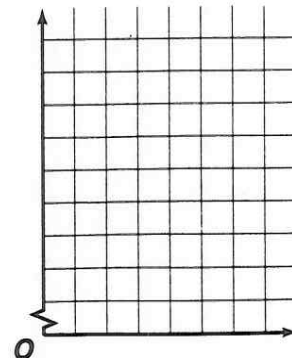


2. The table below shows the average monthly household cable bill for 1990-1996.

- Graph the ordered pairs (year, bill) on the coordinate plane.
- Describe the trend of cable bills over time.

Year	Average Cable Bill
1990	\$17.60
1991	\$19.20
1992	\$20.62
1993	\$22.49
1994	\$21.60
1995	\$23.07
1996	\$25.50

Source: USA TODAY





# Study Guide

## Estimating with Fractions

Use rounding or patterns to estimate with fractions.

**Rounding:** For mixed numbers, round to the nearest whole number.

$$4\frac{1}{6} + 3\frac{7}{8} \rightarrow 4 + 4 = 8$$

$$4\frac{1}{6} + 3\frac{7}{8} \text{ is about } 8.$$

For proper fractions, round to 0,  $\frac{1}{2}$  or 1.

$$\frac{11}{12} - \frac{4}{9} \rightarrow 1 - \frac{1}{2} = \frac{1}{2}$$

$$\frac{11}{12} - \frac{4}{9} \text{ is about } \frac{1}{2}.$$

**Compatible Numbers:**  $\frac{1}{4} \times 19\frac{1}{2} \rightarrow \frac{1}{4} \times 20 = 5$

20 is divisible by 4.

$$\frac{1}{4} \times 19\frac{1}{2} \text{ is about } 5.$$

$$29\frac{1}{3} \div 3\frac{9}{10} \rightarrow 28 \div 4 = 7$$

28 is divisible by 4.

$$29\frac{1}{3} \div 3\frac{9}{10} \text{ is about } 7.$$

Round each fraction to 0,  $\frac{1}{2}$ , or 1.

1.  $\frac{7}{8}$

2.  $\frac{1}{5}$

3.  $\frac{11}{12}$

4.  $\frac{3}{7}$

5.  $\frac{4}{9}$

Round to the nearest whole number.

6.  $6\frac{3}{4}$

7.  $7\frac{2}{5}$

8.  $4\frac{7}{9}$

9.  $12\frac{2}{11}$

10.  $1\frac{1}{7}$

Estimate.

11.  $\frac{3}{5} + \frac{1}{4}$

12.  $\frac{7}{9} - \frac{2}{5}$

13.  $5\frac{1}{8} + 6\frac{9}{11}$

14.  $3\frac{9}{10} - 2\frac{1}{8}$

15.  $\frac{4}{5} \times \frac{7}{8}$

16.  $3\frac{5}{6} \times 2\frac{1}{9}$

17.  $\frac{1}{10} \times 27\frac{1}{2}$

18.  $\frac{6}{7} \div \frac{11}{12}$

19.  $16\frac{1}{3} \div 3\frac{7}{9}$





# Study Guide

## Adding and Subtracting Fractions

To add and subtract fractions, rename the fractions with a common denominator as necessary. Then add or subtract the numerators and simplify.

**Examples** Add or subtract. Write each sum or difference in simplest form.

*Find the least common multiple (LCM).*

*Rename the fractions with a common denominator.*

*Add numerators. Simplify.*

$$\begin{array}{r} \frac{7}{8} \\ + \frac{7}{12} \\ \hline \end{array}$$

$$8 = 2 \times 2 \times 2$$

$$12 = 2 \times 2 \times 3$$

The LCM of 8 and 12 is  $2 \times 2 \times 2 \times 3$ , or 24.

$$\frac{7}{8} = \frac{21}{24}$$

$$+ \frac{7}{12} = \frac{14}{24}$$

$$\frac{21}{24}$$

$$+ \frac{14}{24}$$

$$\frac{35}{24} = 1\frac{11}{24}$$

*Find the LCM.*

*Rename.*

*Subtract. Simplify.*

$$\begin{array}{r} \frac{7}{9} \\ - \frac{1}{6} \\ \hline \end{array}$$

$$9 = 3 \times 3$$

$$6 = 2 \times 3$$

The LCM of 6 and 9 is  $2 \times 3 \times 3$ , or 18.

$$\frac{7}{9} = \frac{14}{18}$$

$$- \frac{1}{6} = \frac{3}{18}$$

$$\frac{14}{18}$$

$$- \frac{3}{18}$$

$$\frac{11}{18}$$

**Add or subtract. Write each sum or difference in simplest form.**

1.  $\frac{5}{8} + \frac{1}{8}$

2.  $\frac{7}{9} - \frac{2}{9}$

3.  $\frac{1}{2} + \frac{3}{4}$

4.  $\frac{2}{5} - \frac{1}{6}$

5.  $\frac{4}{7} + \frac{1}{2}$

6.  $\frac{11}{12} - \frac{2}{3}$

7.  $\frac{4}{9} + \frac{5}{6}$

8.  $\frac{5}{6} - \frac{5}{8}$

9.  $\frac{1}{4} + \frac{3}{8}$

10.  $\frac{8}{15} - \frac{2}{5}$

11.  $\frac{7}{12} - \frac{3}{10}$

12.  $\frac{1}{2} + \frac{1}{6}$





# Study Guide

## Adding and Subtracting Mixed Numbers

To add or subtract mixed number:

1. Add or subtract the fractions. Rename if necessary.
2. Add or subtract the whole numbers.
3. Rename and simplify.

### Examples

$$\begin{array}{r} 1 \quad 14\frac{1}{2} \\ + 18\frac{2}{3} \\ \hline \end{array} \longrightarrow \begin{array}{r} 14\frac{3}{6} \\ + 18\frac{4}{6} \\ \hline \end{array} \longrightarrow \begin{array}{r} 14\frac{3}{6} \\ + 18\frac{4}{6} \\ \hline \frac{7}{6} \end{array} \longrightarrow \begin{array}{r} 14\frac{3}{6} \\ + 18\frac{4}{6} \\ \hline 32\frac{7}{6} = 33\frac{1}{6} \end{array}$$

$$\begin{array}{r} 2 \quad 21 \\ - 12\frac{5}{8} \\ \hline \end{array} \longrightarrow \begin{array}{r} 20\frac{8}{8} \\ - 12\frac{5}{8} \\ \hline \end{array} \longrightarrow \begin{array}{r} 20\frac{8}{8} \\ - 12\frac{5}{8} \\ \hline \frac{3}{8} \end{array} \longrightarrow \begin{array}{r} 20\frac{8}{8} \\ - 12\frac{5}{8} \\ \hline 8\frac{3}{8} \end{array}$$

### Complete.

1.  $7\frac{1}{6} = 6\frac{\square}{6}$

2.  $5\frac{2}{5} = 4\frac{\square}{5}$

3.  $8\frac{1}{2} = 7\frac{\square}{2}$

4.  $9 = 8\frac{\square}{7}$

5.  $4\frac{12}{9} = \square\frac{1}{3}$

6.  $7\frac{10}{8} = 8\frac{\square}{4}$

Add or subtract. Write each sum or difference in simplest form.

7.  $8\frac{1}{7} + 5\frac{3}{7}$

8.  $9\frac{3}{4} - 2\frac{1}{4}$

9.  $6\frac{5}{8} + 3\frac{3}{8}$

10.  $5\frac{1}{2} - 3\frac{1}{4}$

11.  $6\frac{1}{3} + 2\frac{1}{6}$

12.  $9 - 3\frac{2}{5}$

13.  $2\frac{3}{4} + 7\frac{3}{4}$

14.  $6\frac{1}{2} - 6\frac{1}{3}$

15.  $18\frac{1}{2} + 5\frac{5}{8}$

16.  $13\frac{2}{9} - 7\frac{1}{3}$

17.  $15\frac{14}{15} + 13\frac{1}{2}$

18.  $26 - 6\frac{12}{13}$



## Study Guide

### *Multiplying Fractions and Mixed Numbers*

To multiply fractions:

Multiply the numerators.

Then multiply the denominators.

$$\frac{5}{6} \times \frac{3}{5} = \frac{5 \times 3}{6 \times 5} = \frac{15}{30} = \frac{1}{2}$$

To multiply mixed numbers:

Rename each mixed number as a fraction.

Multiply the fractions.

$$7 \times 1\frac{1}{4} = \frac{7}{1} \times \frac{5}{4} = \frac{35}{4} = 8\frac{3}{4}$$

**Multiply. Write each product in simplest form.**

1.  $\frac{2}{3} \times \frac{1}{4}$

2.  $\frac{3}{7} \times \frac{1}{2}$

3.  $\frac{1}{3} \times \frac{3}{5}$

4.  $\frac{1}{2} \times \frac{6}{7}$

5.  $\frac{3}{8} \times 4$

6.  $\frac{7}{10} \times \frac{5}{7}$

7.  $\frac{4}{9} \times 3$

8.  $\frac{1}{4} \times \frac{1}{4}$

9.  $1\frac{1}{2} \times 6$

10.  $\frac{3}{4} \times 1\frac{2}{3}$

11.  $3\frac{1}{3} \times 2\frac{1}{2}$

12.  $4\frac{1}{5} \times \frac{1}{7}$

13.  $1\frac{1}{9} \times \frac{3}{5}$

14.  $6 \times \frac{11}{12}$

15.  $\frac{1}{2} \times 2\frac{2}{3}$



# Study Guide

## Integration: Measurement Changing Customary Units

Customary Units	
Weight	Liquid Capacity
1 pound (lb) = 16 ounces (oz) 1 ton (T) = 2,000 pounds	1 cup (c) = 8 fluid ounces (fl oz) 1 pint (pt) = 2 cups 1 quart (qt) = 2 pints 1 gallon (1 gal) = 4 quarts

To change from larger units to smaller units, multiply.

**Example 1**  $5\frac{1}{2}$  lb = \_\_\_\_\_ oz      *larger unit* → *smaller unit*

$$5\frac{1}{2} \times 16 = 88 \quad \text{Multiply to change from pounds to ounces.}$$

$$5\frac{1}{2} \text{ lb} = 88 \text{ oz}$$

To change from smaller units to larger units, divide.

**Example 2** 28 fl oz = \_\_\_\_\_ c      *smaller unit* → *larger unit*

$$28 \div 8 = 3\frac{1}{2} \quad \text{Divide to change from quarts to gallons.}$$

$$28 \text{ fl oz} = 3\frac{1}{2} \text{ c}$$

**Complete.**

1. 4 lb = \_\_\_\_\_ oz

2. 3 T = \_\_\_\_\_ lb

3. 5 c = \_\_\_\_\_ fl oz

4. 40 oz = \_\_\_\_\_ lb

5. 5,000 lb = \_\_\_\_\_ T

6. 2 pt = \_\_\_\_\_ c

7. 1.5 lb = \_\_\_\_\_ oz

8. 10 pt = \_\_\_\_\_ qt

9. 12 qt = \_\_\_\_\_ gal

10. 2.5 pt = \_\_\_\_\_ c

11. 1.5 gal = \_\_\_\_\_ qt

12. 3.5 qt = \_\_\_\_\_ pt

13. 12 fl oz = \_\_\_\_\_ c

14. 24 oz = \_\_\_\_\_ lb

15. 7 c = \_\_\_\_\_ fl oz

16. 3 gal = \_\_\_\_\_ qt

17. 5.5 T = \_\_\_\_\_ lb

18. 48 fl oz = \_\_\_\_\_ c

# 7-6

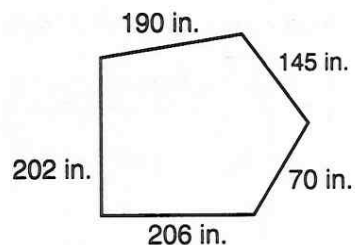
## Study Guide

### Integration: Geometry Perimeter

The distance around a geometric figure is called its **perimeter**.

To find the perimeter of a figure, add the measures of its sides.

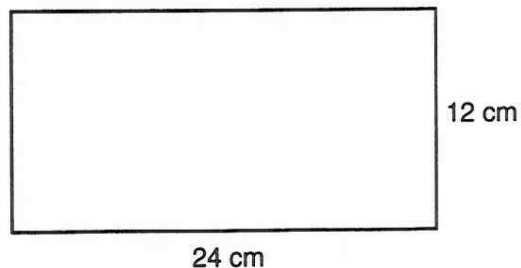
**Example 1**  $P = 145 + 70 + 206 + 202 + 190$   
 $= 813$   
 The perimeter is 813 inches.



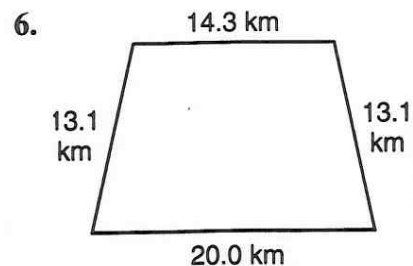
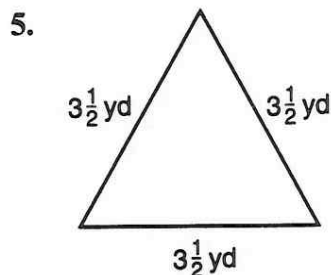
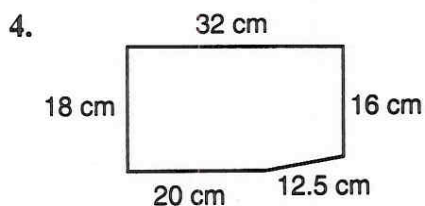
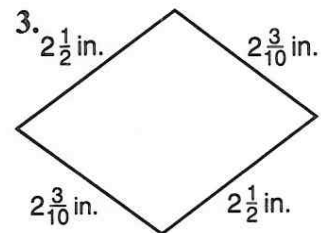
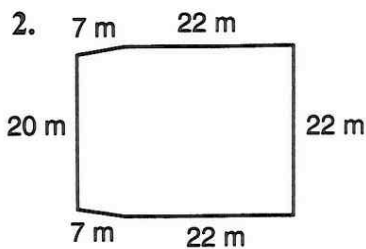
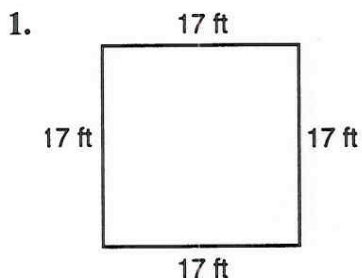
The perimeter of a rectangle equals 2 times the length plus 2 times the width.

$$P = 2\ell + 2w$$

**Example 2**  $P = (2 \cdot 24) + (2 \cdot 12)$   
 $= 48 + 24$   
 $= 72$   
 The perimeter is 72 centimeters.



**Find the perimeter of each figure shown or described.**



7. rectangle:  
 $\ell = 8$  feet  
 $w = 5$  feet

8. rectangle:  
 $\ell = 3.5$  meters  
 $w = 2$  meters

9. rectangle:  
 $\ell = 17$  yards  
 $w = 8.5$  yards





# Study Guide

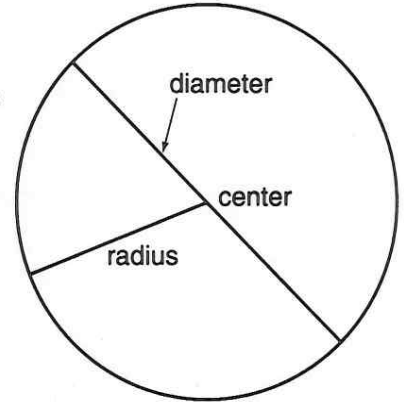
## Integration: Geometry Circles and Circumference

A **circle** is the set of all points in a plane that are the same distance from a given point called the **center**.

The **diameter** ( $d$ ) is the distance across the circle through its center.

The **radius** ( $r$ ) is the distance from the center to any point on the circle.

The **circumference** ( $C$ ) is the distance around the circle.



**Examples** 1 Find the circumference of a circle with a diameter of 7.5 inches.

$$C = \pi d$$

$$C \approx 3.14 \times 7.5 \quad \text{Use } 3.14 \text{ for } \pi.$$

$$C \approx 23.55 \quad \text{The circumference of the circle is about 23.55 inches.}$$

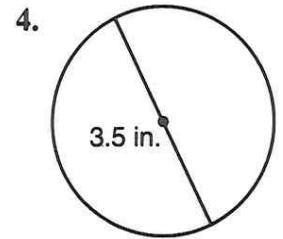
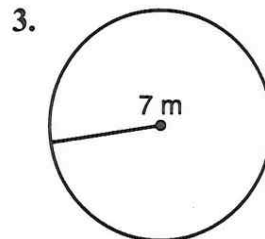
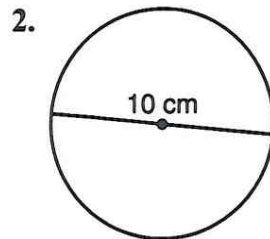
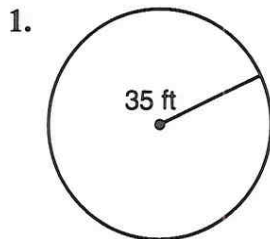
2 If the radius of a circle is 14 inches, what is its circumference?

$$C = 2\pi r$$

$$C \approx 2 \times \frac{22}{7} \times 14 \quad \text{Use } \frac{22}{7} \text{ for } \pi.$$

$$C \approx 88 \quad \text{The circumference of the circle is about 88 inches.}$$

**Find the circumference of each circle to the nearest tenth.**  
Use  $\frac{22}{7}$  or 3.14 for  $\pi$ .



5.  $d = 21$  km

6.  $r = 42$  mi

7.  $d = 68$  m

8.  $r = 700$  ft

9.  $r = 91$  cm

10.  $d = 5$  km

11.  $r = 90$  ft

12.  $d = 6.3$  m



# Study Guide

## Properties

The table shows the properties for addition and multiplication of fractions.

Property	Examples
<b>Commutative</b> The sum or product of two fractions is the same regardless of the order in which they are added or multiplied.	$\frac{1}{2} + \frac{1}{4} = \frac{1}{4} + \frac{1}{2}$ $\frac{2}{3} \times \frac{1}{5} = \frac{1}{5} \times \frac{2}{3}$
<b>Associative</b> The sum or product of three or more fractions is the same regardless of the way in which they are grouped.	$\left(\frac{1}{2} + \frac{5}{6}\right) + \frac{7}{8} = \frac{1}{2} + \left(\frac{5}{6} + \frac{7}{8}\right)$ $\frac{1}{8} \times \left(\frac{3}{4} \times \frac{6}{7}\right) = \left(\frac{1}{8} \times \frac{3}{4}\right) \times \frac{6}{7}$
<b>Identity</b> The sum of any fraction and 0 is the fraction. The product of any fraction and 1 is the fraction.	$\frac{7}{8} + 0 = \frac{7}{8}$ $\frac{5}{9} \times 1 = \frac{5}{9}$
<b>Inverse (Reciprocal)</b> The product of a fraction and its reciprocal is 1.	$\frac{7}{8} \times \frac{8}{7} = 1$
<b>Distributive</b> The sum of two fractions multiplied by a number is equal to the sum of the products of each fraction and the number.	$\frac{2}{3}\left(\frac{1}{2} + \frac{3}{7}\right) = \left(\frac{2}{3} \times \frac{1}{2}\right) + \left(\frac{2}{3} \times \frac{3}{7}\right)$

Name the property shown by each statement.

1.  $\frac{11}{12} \times 1 = \frac{11}{12}$

2.  $\left(\frac{1}{5} + \frac{2}{3}\right) + \frac{5}{9} = \frac{1}{5} + \left(\frac{2}{3} + \frac{5}{9}\right)$

3.  $\frac{3}{4} \times \frac{5}{6} = \frac{5}{6} \times \frac{3}{4}$

4.  $\frac{3}{5} \times \left(\frac{1}{3} + \frac{5}{7}\right) = \left(\frac{3}{5} \times \frac{1}{3}\right) + \left(\frac{3}{5} \times \frac{5}{7}\right)$

5.  $\frac{9}{4} \times \frac{4}{9} = 1$

6.  $\frac{4}{5} + \frac{3}{4} = \frac{3}{4} + \frac{4}{5}$

7.  $0 + \frac{17}{18} = \frac{17}{18}$

8.  $\frac{2}{9} \times \left(\frac{1}{4} \times \frac{9}{10}\right) = \left(\frac{2}{9} \times \frac{1}{4}\right) \times \frac{9}{10}$

Name the multiplicative inverse of each number.

9.  $\frac{6}{11}$

10.  $\frac{19}{3}$

11.  $\frac{1}{8}$

12. 9



# Study Guide

## Dividing Fractions and Mixed Numbers

To divide fractions and mixed numbers:

1. Write any mixed numbers as improper fractions.
2. Find the reciprocal of the divisor.
3. Multiply the dividend by the reciprocal of the divisor.

**Examples** 1  $\frac{5}{8} \div \frac{5}{12}$

The reciprocal of  $\frac{5}{12}$  is  $\frac{12}{5}$ .

$$\begin{aligned}\frac{5}{8} \div \frac{5}{12} &= \frac{5}{8} \times \frac{12}{5} \\ &= \frac{60}{40} \text{ or } 1\frac{1}{2}\end{aligned}$$

2  $7 \div 3\frac{1}{2} \rightarrow \frac{7}{1} \div \frac{7}{2}$

The reciprocal of  $\frac{7}{2}$  is  $\frac{2}{7}$ .

$$\begin{aligned}7 \div 3\frac{1}{2} &= \frac{7}{1} \times \frac{2}{7} \\ &= \frac{14}{7} \text{ or } 2\end{aligned}$$

**Name the reciprocal of each number.**

1.  $\frac{6}{11}$

2.  $\frac{14}{5}$

3. 8

4.  $\frac{1}{5}$

**Divide. Write each quotient in simplest form.**

5.  $n = \frac{7}{8} \div \frac{1}{4}$

6.  $p = \frac{2}{5} \div \frac{5}{8}$

7.  $y = \frac{1}{3} \div \frac{1}{6}$

8.  $8 \div \frac{1}{3} = k$

9.  $\frac{5}{9} \div 5 = v$

10.  $24 \div 1\frac{1}{2} = t$

11.  $c = 2\frac{1}{2} \div 5$

12.  $z = 3\frac{1}{3} \div \frac{2}{9}$

13.  $m = \frac{5}{8} \div 2\frac{1}{2}$

14.  $1\frac{1}{3} \div 2\frac{1}{2} = t$

15.  $3\frac{1}{3} \div 1\frac{2}{5} = f$

16.  $\frac{9}{10} \div 5\frac{2}{5} = k$