

RETEACHING 2-1

UNITS OF MEASURE

The process of finding size, quantities, or amounts is called measurement. The smaller the unit of measure you use, the more precise the measurement.

EXERCISES

Which unit of measure gives a more precise measurement?

1. milliliter, liter (HINT: There are 1000 milliliters in 1 liter.)
2. inch, yard (HINT: There are 36 inches in 1 yard.)
3. gram, kilogram (HINT: There are 1000 grams in 1 kilogram.)
4. pint, gallon (HINT: There are 8 pints in 1 gallon.)

Tell whether each statement is true or false. Write true or false.

5. A pound gives a more precise measurement than an ounce.
6. A foot gives a more precise measurement than a mile.
7. A milligram gives a more precise measurement than a gram.
8. A kilometer gives a more precise measurement than a meter.
9. A cup gives a more precise measurement than a pint.

Chapter 6

Measurement

Customary Measurements:

Time	Abbreviations	Length	Abbreviations
1 week = 7 days	week = wk	1 mile = 5,280 feet	mile = mi
1 day = 24 hours	hour = hr or h	1 yard = 3 feet	yard = yd
1 hour = 60 minutes	minutes = min	1 foot = 12 inches	foot = ft
1 minute = 60 seconds	seconds = sec		

Volume	Abbreviations	Weight	Abbreviations
1 gallon = 4 quarts	gallon = gal	16 ounces = 1 pound	pound = lb
1 quart = 2 pints	quart = qt		ounce = oz
1 pint = 2 cups	pint = pt		
1 cup = 8 ounces	ounce = oz		

EXAMPLE: Simplify: 2 days 34 hr 75 min

Step 1: 75 minutes is more than 1 hour. There are 60 minutes in an hour, so divide 75 by 60.

$$\begin{array}{r}
 \phantom{2 \text{ days } 34 \text{ hr }} \overset{1 \text{ hr}}{60 \overline{) 75}} \\
 \underline{-60} \\
 15 \text{ min}
 \end{array}
 \qquad
 \begin{array}{r}
 2 \text{ days } 34 \text{ hr } \overset{75 \text{ min}}{75} \\
 + \phantom{2 \text{ days } 34 \text{ hr }} \underline{1 \text{ hr } 15 \text{ min}} \\
 2 \text{ days } 35 \text{ hr } 15 \text{ min}
 \end{array}$$

Step 2: 35 hours is more than 1 day. There are 24 hours in a day, so divide 35 hours by 24.

$$\begin{array}{r}
 \phantom{2 \text{ days } 35 \text{ hr }} \overset{1 \text{ day}}{24 \overline{) 35}} \\
 \underline{-24} \\
 11 \text{ hr}
 \end{array}
 \qquad
 \begin{array}{r}
 2 \text{ days } \overset{35 \text{ hr}}{35} \text{ hr } 15 \text{ min} \\
 + \underline{1 \text{ day } 11 \text{ hr}} \\
 3 \text{ days } 11 \text{ hr } 15 \text{ min}
 \end{array}$$

Simplify the following:

- | | | |
|-------------------------------|--------------------------------|----------------------------------|
| 1. 3 lb 20 oz
_____ | 5. 2 hr 84 min 62 sec
_____ | 9. 2 ft 18 in
_____ |
| 2. 2 cup 12 oz
_____ | 6. 1 gal 6 qt 3 pt
_____ | 10. 1 lb 33 oz
_____ |
| 3. 3 wk 9 days 30 hr
_____ | 7. 3 yd 10 ft 18 in
_____ | 11. 23 hr 62 min 94 sec
_____ |
| 4. 1 pt 1 cup 16 oz
_____ | 8. 2 wk 8 days 36 hr
_____ | 12. 3 days 54 hr 75 min
_____ |

EXTRA PRACTICE 2-2

WORK WITH MEASUREMENTS

 EXERCISES

Complete.

1. 32 fl oz = _____ c 2. 18 in. = _____ ft 3. 5 L = _____ mL
 4. 6 yd = _____ ft 5. 3 T = _____ lb 6. 90 in. = _____ ft _____ in.
 7. 72 in. = _____ yd 8. 0.6 m = _____ cm 9. 7 g = _____ mg
 10. 80 m = _____ km 11. 9 qt = _____ gal _____ qt 12. 2 gal = _____ qt
 13. 2400 L = _____ kL 14. 4.2 km = _____ m 15. 40 ft = _____ yd _____ ft
 16. 1.8 m = _____ mm 17. 5 yd = _____ in. 18. 6 qt = _____ pt

Complete. Write each answer in simplest form.

19.
$$\begin{array}{r} 8 \text{ lb } 4 \text{ oz} \\ + 3 \text{ lb } 15 \text{ oz} \\ \hline \end{array}$$

20.
$$\begin{array}{r} 6 \text{ ft } 2 \text{ in.} \\ - 3 \text{ ft } 6 \text{ in.} \\ \hline \end{array}$$

21.
$$\begin{array}{r} 8 \text{ yd} \\ - 3 \text{ yd } 2 \text{ ft} \\ \hline \end{array}$$

22.
$$\begin{array}{r} 4 \text{ lb } 5 \text{ oz} \\ - \quad \quad 8 \text{ oz} \\ \hline \end{array}$$

23.
$$\begin{array}{r} 2 \text{ c } 4 \text{ fl oz} \\ \times \quad \quad \quad 6 \\ \hline \end{array}$$

24.
$$\begin{array}{r} 7 \text{ lb } 6 \text{ oz} \\ \times \quad \quad \quad 3 \\ \hline \end{array}$$

25. 3 yd 2 ft \div 2 _____ 26. 5 ft 6 in. \div 4 _____ 27. 8 gal 2 qt \div 8 _____
 28. 8 cm + 6 mm = _____ mm 29. 60 g \cdot 8 = _____ kg
 30. 3.5 kg + 200 g = _____ kg 31. 8 \cdot 25 mm = _____ cm
 32. 2.4 L \div 6 = _____ mL 33. 2 m - 100 mm = _____ cm
 34. 400 mg \div 5 = _____ g 35. 60 mL \cdot 6 = _____ L
 36. 1 km - 60 cm = _____ m 37. 1 kL \div 5 = _____ L
 38. Rita bought 168 inches of string for a kite at \$0.25/ft. How much did she pay for the string, to the nearest cent? _____
 39. Nic is making a cake and the recipe calls for 2 cups of milk. He has 1 quart of milk. Does he have enough milk to make the cake? If so, will he have any left over? How much? _____

RETEACHING 2-2

WORK WITH MEASUREMENTS

When adding or multiplying measurements, you may need to change the units of the sum or the product.

EXERCISES

Write each answer in simplified form.

1.
$$\begin{array}{r} 7 \text{ lb } 13 \text{ oz} \\ + 3 \text{ lb } 7 \text{ oz} \\ \hline \end{array}$$

2.
$$\begin{array}{r} 10 \text{ ft } 7 \text{ in.} \\ + 4 \text{ ft } 11 \text{ in.} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 10 \text{ yd } 7 \text{ ft} \\ - 4 \text{ yd } 9 \text{ ft} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 12 \text{ gal } 3 \text{ qt} \\ - 8 \text{ gal } 5 \text{ qt} \\ \hline \end{array}$$

5.
$$\begin{array}{r} 3 \text{ c } 12 \text{ fl oz} \\ \times \quad \quad 4 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 9 \text{ lb } 7 \text{ oz} \\ \times \quad \quad 5 \\ \hline \end{array}$$

7. $7 \text{ yd } 1 \text{ ft} \div 2 = \underline{\hspace{2cm}}$

8. $7 \text{ c } 7 \text{ fl oz} \div 3 = \underline{\hspace{2cm}}$

Complete.

9. $3.5 \text{ kg} + 500 \text{ g} = \underline{\hspace{1cm}} \text{ kg}$

10. $1.8 \text{ L} \div 5 = \underline{\hspace{1cm}} \text{ mL}$

11. $2.75 \text{ cm} \cdot 12 = \underline{\hspace{1cm}} \text{ mm}$

12. $6 \text{ m} - 350 \text{ cm} = \underline{\hspace{1cm}} \text{ cm}$

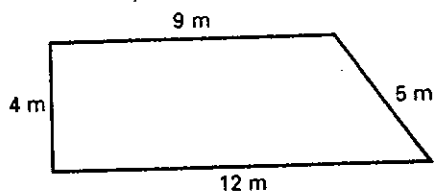
RETEACHING 2-3

LINEAR MEASURE AND PERIMETER

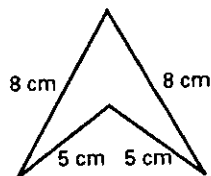
The **perimeter** of a plane figure is the distance around it. To find the perimeter of any plane figure, find the sum of the lengths of the sides.

Find the perimeter of each plane figure.

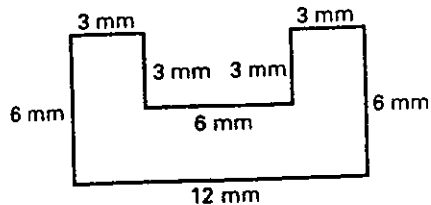
1.



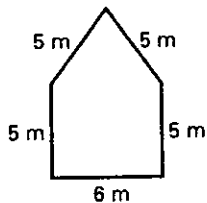
2.



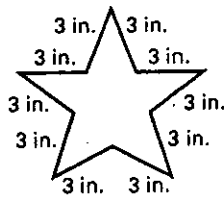
3.



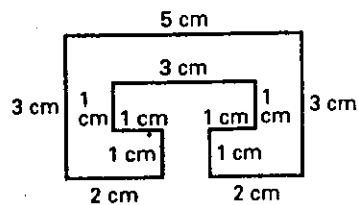
4.



5.



6.



7. Find the perimeter of a rectangular garden that has a width of 16 ft and a length of 35 ft. _____

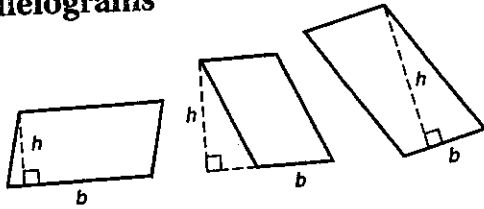
8. A triangle has sides that measure 40 cm, 75 cm, and 85 cm. What is its perimeter?

RETEACHING 2-4

AREA

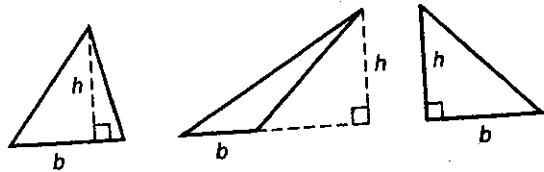
To find the area of a parallelogram or a triangle, you use the measure of the base and the height. The height is always perpendicular to the base. Here are some possible positions of the height and base.

Parallelograms



Area of a parallelogram: $A = b \cdot h$

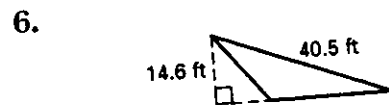
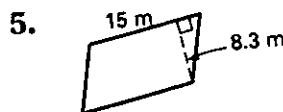
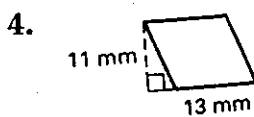
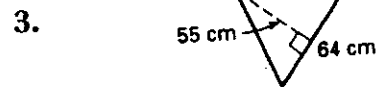
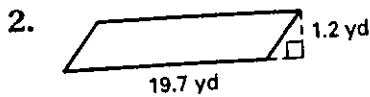
Triangles



Area of a triangle: $A = \frac{1}{2}(b \cdot h)$

EXERCISES

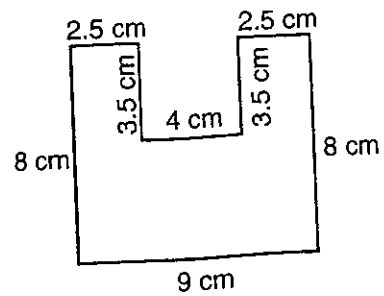
Find the area of each figure to the nearest whole number.



RETEACHING 2-9

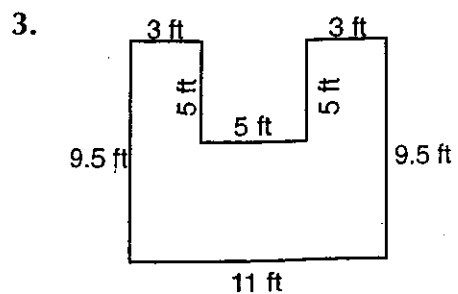
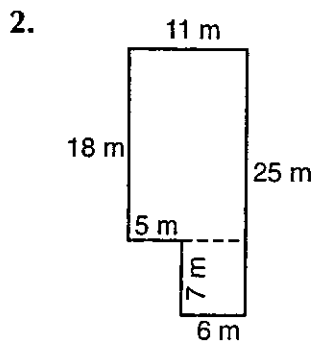
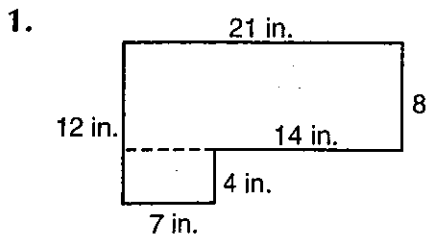
AREA OF IRREGULAR SHAPES

To find the area of a shape like the one at the right, first separate it into smaller figures. Then find and add the area of the smaller figures.



EXERCISES

Find the area of each figure. Use the dashed segments in Exercises 1 and 2 to help you. Draw dashed segments in the figure in Exercise 3 to help you.



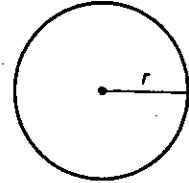
RETEACHING 2-7

CIRCUMFERENCE AND AREA OF A CIRCLE

The **circumference** of a circle is the distance around it. The circumference of any circle, divided by the diameter, is always equal to the number π (pi), which has the approximate value 3.14 or $\frac{22}{7}$. You can find the circumference of a circle when you know its diameter, using the formula $C = \pi d$. Because the diameter is twice the radius, if you know the radius of a circle, you can find the circumference of the circle using the formula $C = 2\pi r$.

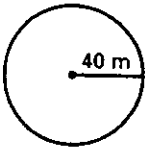
To find the area of a circle, use the formula $A = \pi r^2$, where r is the radius of the circle.

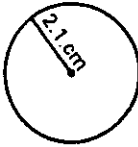
If you are given the diameter of the circle, first find the radius by taking one half of the diameter.

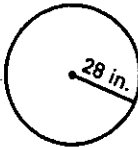


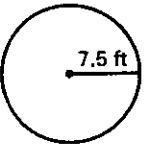
EXERCISES

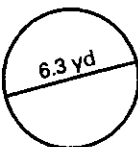
Find the circumference. Use 3.14 or $\frac{22}{7}$ for π . Round the answer to the nearest tenth.


1.  _____

2.  _____

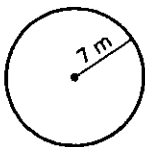
3.  _____

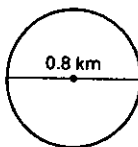
4.  _____

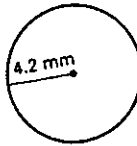
5.  _____

6.  _____

Find the area. Use 3.14 for π . Round the answer to the nearest tenth.

7.  _____

8.  _____

9.  _____

RATIO

When ratios represent the same comparison, they are called **equivalent ratios**. Finding the equivalent ratios is similar to finding equivalent fractions.

EXERCISES

Write three equivalent ratios for each of the following.

1. 2:7	_____	2. 11:12	_____	3. 48:36	_____
	_____		_____		_____
	_____		_____		_____

4. $\frac{5}{8}$	_____	5. $\frac{16}{3}$	_____	6. $\frac{9}{10}$	_____
	_____		_____		_____
	_____		_____		_____

Are the ratios equivalent? Write *yes* or *no*.

7. $\frac{2}{5}, \frac{10}{25}$	_____	8. $\frac{3}{20}, \frac{4}{21}$	_____	9. 10:12, 15:18	_____
---------------------------------	-------	---------------------------------	-------	-----------------	-------

10. $\frac{4}{12}, \frac{10}{30}$	_____	11. 5:14, 20:70	_____	12. $\frac{16}{24}, \frac{4}{6}$	_____
-----------------------------------	-------	-----------------	-------	----------------------------------	-------

PROPORTION AND SCALE DRAWINGS

A **proportion** is an equation that states that two ratios are equivalent. A proportion can be written in two ways:

$$5:15 = 3:9 \text{ or } \frac{5}{15} = \frac{3}{9}$$

The **cross-products** of the terms of a proportion are equal. You can use this fact to determine whether a statement is a proportion or to find the unknown term in a proportion.

EXERCISES

Tell whether each statement is a proportion. Write = or \neq .

1. $\frac{15}{55} \bigcirc \frac{10}{50}$

2. $\frac{4}{18} \bigcirc \frac{16}{72}$

3. $\frac{60}{9} \bigcirc \frac{40}{6}$

4. $\frac{2}{3} \bigcirc \frac{44}{66}$

5. $\frac{26}{52} \bigcirc \frac{50}{75}$

6. $\frac{5}{6} \bigcirc \frac{75}{90}$

Use mental math to solve each proportion.

7. $3:4 = 9:?$ _____

8. $6:? = 4:20$ _____

9. $35:15 = ?:3$ _____

10. $\frac{14}{21} = \frac{24}{?}$ _____

11. $\frac{?}{20} = \frac{100}{125}$ _____

12. $\frac{18}{45} = \frac{?}{25}$ _____