

# Geometry

## Work Sheets

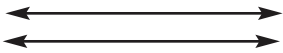
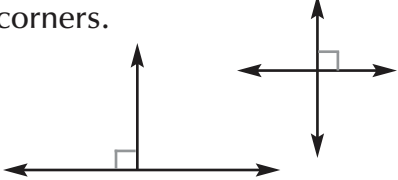
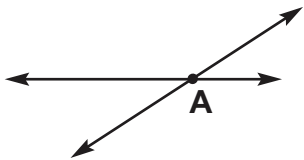
The work sheets are grouped according to math skill. Each skill is then arranged in a sequence of work sheets that build from simple to complex. Choose the work sheets that best fit the student's need and will bring him up to the desired level.

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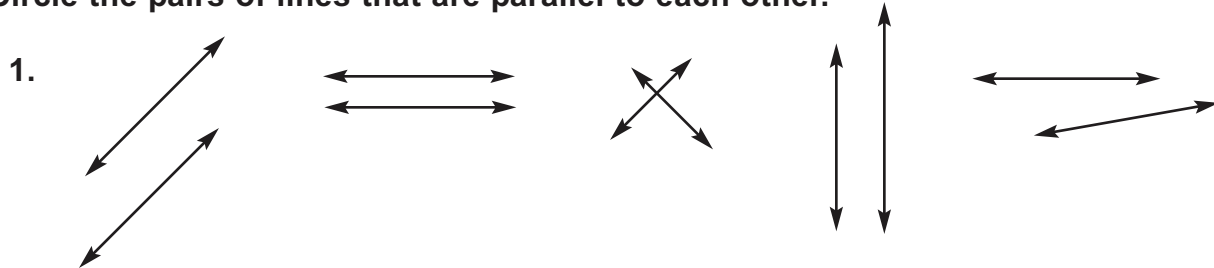
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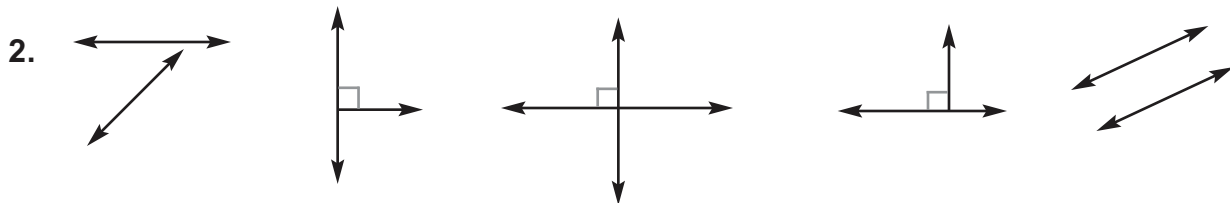
## *Parallel, Perpendicular, Intersecting Lines*

<p><b>Parallel lines</b> are exactly the same distance apart. They never intersect.</p> 	<p><b>Perpendicular lines</b> sit at right angles to each other. They form square corners.</p> 	<p><b>Intersecting lines</b> meet or cross one another. The point where they meet or cross is an <b>intersection</b>.</p> 
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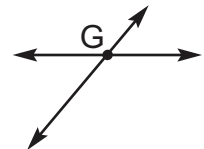
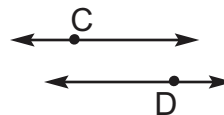
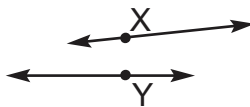
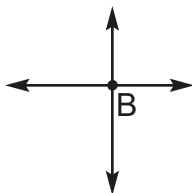
Circle the pairs of lines that are parallel to each other.



Circle the pairs of lines that are perpendicular to each other.



For each pair, name the point of intersection. If the lines do not intersect with each other, write *none*.



3. a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

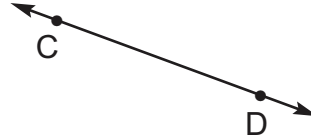
d. \_\_\_\_\_

Match.

- |                        |                              |
|------------------------|------------------------------|
| 4. _____ intersecting  | a. never touching each other |
| 5. _____ perpendicular | b. forming a square corner   |
| 6. _____ parallel      | c. crossing each other       |

## *Lines and Line Segments*

A **line** is straight and neither end stops. If a line is marked with two points we can name it.



Say the points in either order.

Say "**Line AB**" or "**Line BA.**"

Say "**Line DC**" or "**Line CD.**"

Write the points in either order and draw a little *line symbol* ( $\leftrightarrow$ ) above the letters. Notice the *line symbol*.

Write  $\overleftrightarrow{AB}$  or  $\overleftrightarrow{BA}$ .

Write  $\overleftrightarrow{CD}$  or  $\overleftrightarrow{DC}$ .

A **line segment** is part of a line and has two end points.

If the endpoints of a line segment are marked, we can name the line segment.

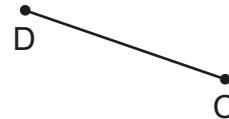
Say the endpoints in either order.

Say "**Line segment AB**" or "**Line segment BA.**"

Say "**Line segment DC**" or "**Line segment CD.**"



Write the endpoints in either order. Draw a little *line segment symbol* ( $\overline{\quad}$ ) above the letters.



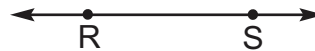
Write  $\overline{AB}$  or  $\overline{BA}$ .

Write  $\overline{CD}$  or  $\overline{DC}$ .

**Use letters and symbols to name the lines.**



1. \_\_\_\_\_



2. \_\_\_\_\_

**Use letters and symbols to name the line segments.**



\_\_\_\_\_

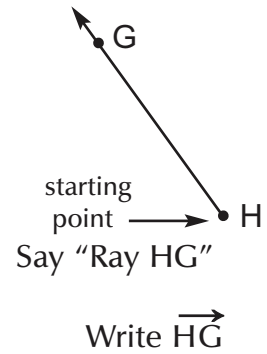
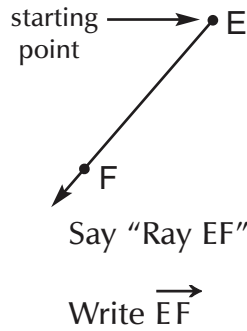
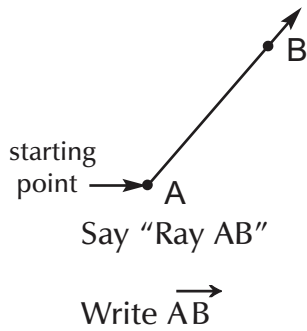


\_\_\_\_\_

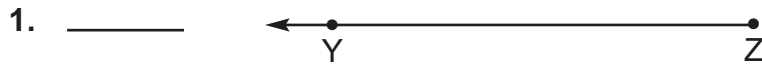
# Rays

A ray starts at a point. An arrow is used to show that the ray keeps going in one direction without stopping.

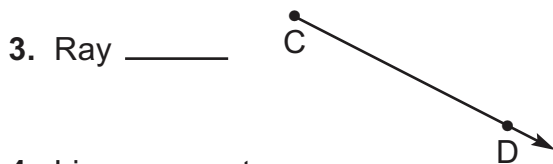
If a ray is marked with two points, we can name it. *Always say and write the starting point first.* Draw a little ray symbol ( $\rightarrow$ ) above the two letters.



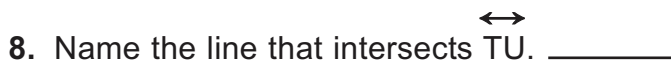
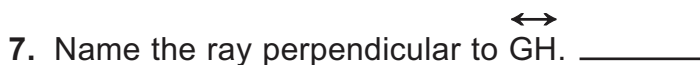
Use letters and symbols to name the rays.



Use letters and symbols to name these.

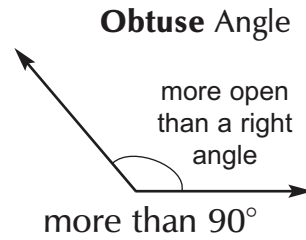
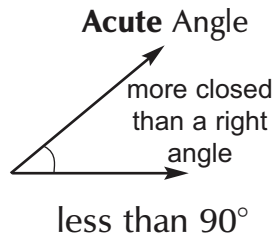
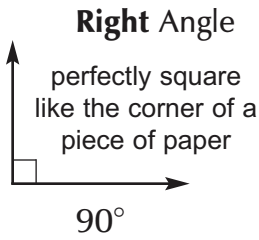


Follow the directions. Use symbols.



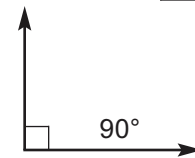
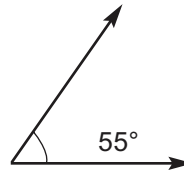
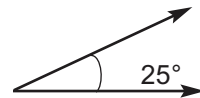
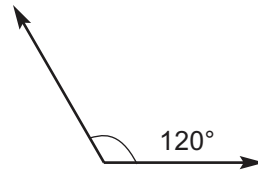
## Types of Angles

To measure how wide open an angle is we use **degrees**.



These angles are measured in degrees. Write *right*, *acute*, or *obtuse* to classify each angle.

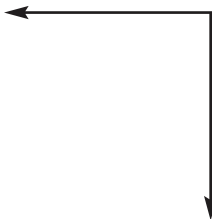
1. 120° is a(n) \_\_\_\_\_ angle.
2. 55° is a(n) \_\_\_\_\_ angle.
3. 90° is a(n) \_\_\_\_\_ angle.
4. 155° is a(n) \_\_\_\_\_ angle.
5. 25° is a(n) \_\_\_\_\_ angle.



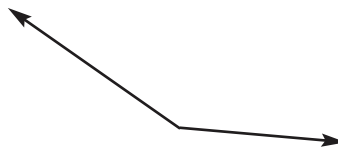
Write *acute*, *obtuse*, or *right*.

6. A 90° angle is called a \_\_\_\_\_ angle.
7. An angle measurement of 115° is called an \_\_\_\_\_ angle.
8. An angle with a measurement of 75° is called an \_\_\_\_\_ angle.

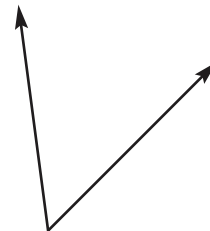
Write *acute*, *obtuse*, or *right* under each angle.



9. a. \_\_\_\_\_



b. \_\_\_\_\_



c. \_\_\_\_\_

## Measuring Volume

How do we measure volume? We use cubic measures.

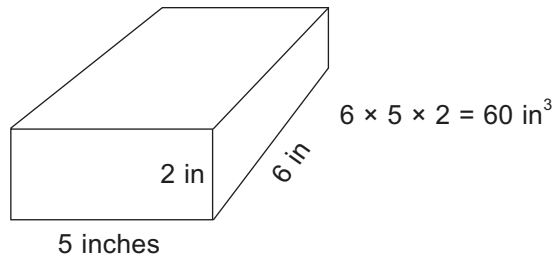
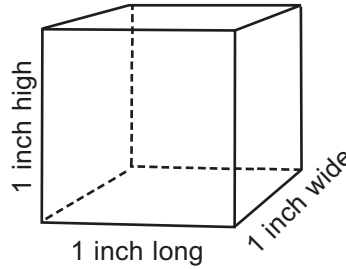
Volume = length  $\times$  width  $\times$  height (3 dimensions)

1 cubic inch

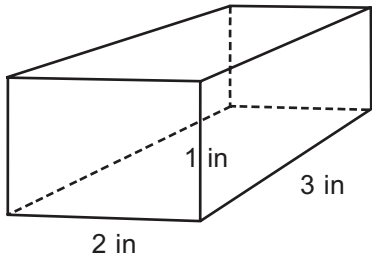
$$1 \times 1 \times 1 = 1 \text{ in}^3$$

Put a little 3 after the unit of measure to show cubic measures.

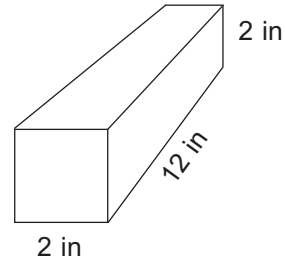
$$1 \text{ in}^3$$



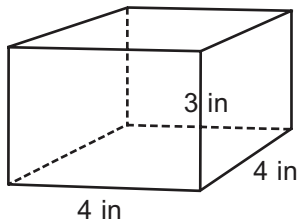
Write a number sentence for each. Give the volume in cubic inches ( $\text{in}^3$ ).



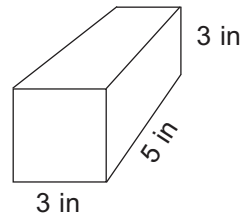
1. a.  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$



b.  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$



2. a.  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$



b.  $\underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$

## *Perimeter and Area*

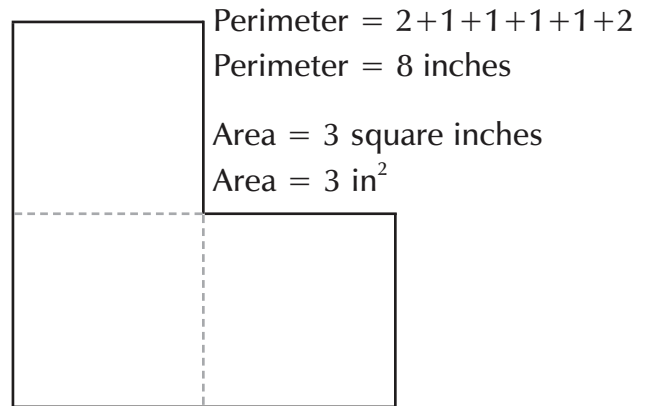
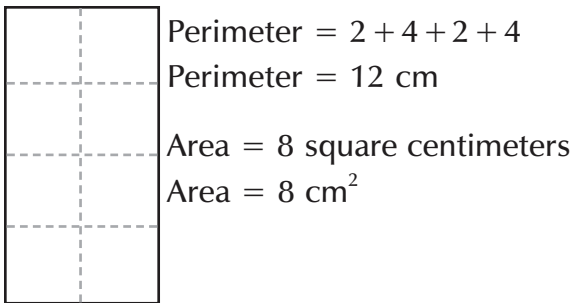
**Perimeter** is the distance around the edge of a shape. It is measured in units of length.

**Area** is the space inside of a shape. It is measured in square units.

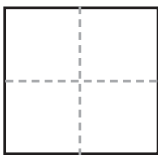
Write the label for area with a small raised <sup>2</sup>.

Example: 3 in<sup>2</sup>

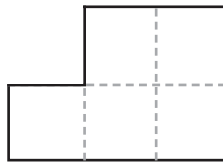
The small raised <sup>2</sup> means "square." Read, "Three square inches."



**Write the perimeter and area of each shape. Use *cm*, *cm<sup>2</sup>*, *in*, or *in<sup>2</sup>*.**



1. a. Perimeter: \_\_\_\_\_ cm  
Area: \_\_\_\_\_ cm<sup>2</sup>



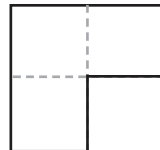
b. Perimeter: \_\_\_\_\_  
Area: \_\_\_\_\_



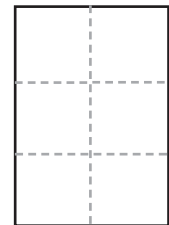
c. Perimeter: \_\_\_\_\_  
Area: \_\_\_\_\_



2. a. Perimeter: \_\_\_\_\_  
Area: \_\_\_\_\_



b. Perimeter: \_\_\_\_\_  
Area: \_\_\_\_\_

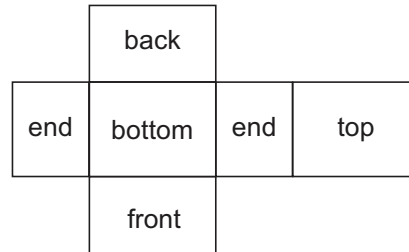
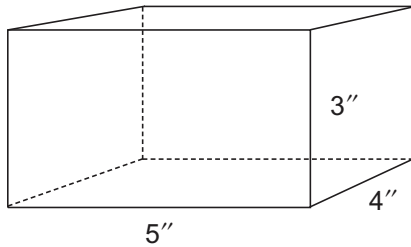


c. Perimeter: \_\_\_\_\_  
Area: \_\_\_\_\_



## *Finding the Surface Area of Prisms*

A rectangular prism has six rectangular faces. To find its surface area, we need to find the area of each face, and then find the sum of the area of the six faces. A diagram of the surface area could be drawn by tracing around each face of the box below, to form its net.



The top and bottom faces are  $5'' \times 4''$ .  
 The two end faces are  $4'' \times 3''$ .  
 The front and back faces are  $5'' \times 3''$ .

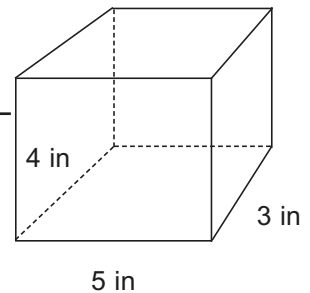
Find each area:

Top & bottom faces	Ends	Front & back faces
$A = lw$	$A = lw$	$A = lw$
$A = 5 \times 4$	$A = 4 \times 3$	$A = 5 \times 3$
$A = 20 \text{ in}^2$	$A = 12 \text{ in}^2$	$A = 15 \text{ in}^2$

$$\begin{aligned} \text{Top} + \text{bottom} + \text{end} + \text{end} + \text{front} + \text{back} &= \text{Surface area} \\ 20 + 20 + 12 + 12 + 15 + 15 &= 94 \text{ in}^2 \\ \text{The surface area of the box is } &94 \text{ in}^2. \end{aligned}$$

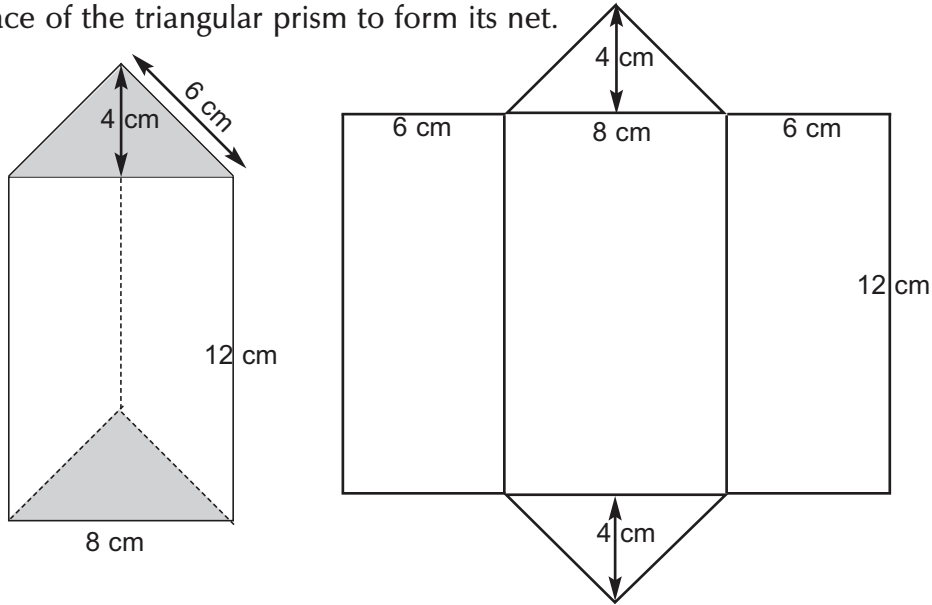
**Answer the questions and find the surface area. Draw or visualize the net to help you.**

1. What are the dimensions (l and w) of the top and bottom faces? \_\_\_\_\_
2. Find the area of both the top and bottom faces. \_\_\_\_\_
3. What are the dimensions of the front and back faces? \_\_\_\_\_
4. Find the area of both the front and back faces. \_\_\_\_\_
5. What are the dimensions of the two side faces? \_\_\_\_\_
6. Find the area of both the two side faces. \_\_\_\_\_
7. Find the total surface area of the prism. \_\_\_\_\_



# Work Sheet 49, continued

A triangular prism has five faces. Two of the faces are triangles, and the remaining three are rectangles. To find its surface area, find the area of each face, and then find the sum of the area of the five faces. A diagram of the surface area could be drawn by tracing around each face of the triangular prism to form its net.



- The two triangular faces have bases of 8 cm and heights of 4 cm.
- Two of the rectangular faces are 12 cm × 6 cm.
- One rectangular face is 12 cm × 8 cm.

Find each area:

Triangular faces	Two Rectangles	One Rectangle
$A = \frac{1}{2} bh$	$A = lw$	$A = lw$
$A = \frac{1}{2} \times 8 \times 4$	$A = 12 \times 6$	$A = 12 \times 8$
$A = 16 \text{ cm}^2$	$A = 72 \text{ cm}^2$	$A = 96 \text{ cm}^2$

Triangular faces + two rectangles + one rectangle = Surface area

$$16 + 16 + 72 + 72 + 96 = 272 \text{ cm}^2$$

The **surface area** of the triangular prism is  $272 \text{ cm}^2$ .

Answer the questions and find the surface area. Draw or visualize the net to help you.

8. Give the base and height of both triangular faces. base \_\_\_\_\_ height \_\_\_\_\_
9. Find the area of each triangular face. \_\_\_\_\_
10. What are the dimensions of one of the congruent rectangular faces?  
\_\_\_\_\_
11. Find the area of each congruent rectangular face. \_\_\_\_\_
12. What are the dimensions of the remaining rectangular face?  
\_\_\_\_\_
13. Find the area of the remaining rectangular face. \_\_\_\_\_
14. Find the total surface area of the prism. \_\_\_\_\_

