CHAPTER 9

Family Letter

Section A

What We Are Learning

Lines and Angles

Vocabulary

These are the math words we are learning:

acute angle an angle that measures less than 90°

adjacent angles two angles that are side by side and have a common vertex and ray

angle formed by two rays with a common endpoint

complementary angles two angles whose measures have a sum of 90°

congruent having the same size and shape

line a set of points that extends without end in opposite directions

line segment a part of a line or a ray that extends from one endpoint to another

obtuse angle an angle whose measure is greater than 90° but less than 180°

plane a perfectly flat surface that extends infinitely in all directions

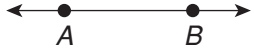
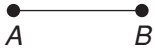
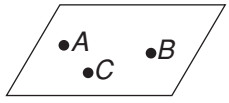
point an exact location in a plane

ray a part of a line that has one endpoint and extends without end in one direction

right angle an angle that measures exactly 90°

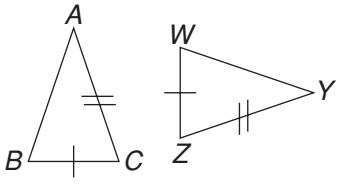
Dear Family,

In this section, the student will be learning the necessary terminology for understanding and applying the concepts of geometry. When given a figure, the student will be able to identify **points, segments, rays, lines,** and **planes.** Use the chart to review these basic concepts.

Concept	Definition	Symbols
Point	An exact location in space. 	point *P*
Line	A set of points that extends without end in opposite directions. 	$\overleftrightarrow{AB}$
Ray	Part of a line that has one endpoint and extends without end in one direction. 	$\overrightarrow{AB}$
Line Segment	A part of a line with two endpoints. 	$\overline{AB}$
Plane	A perfectly flat surface that extends infinitely in all directions. 	plane *ABC*

The student will also learn that congruent figures are figures that have the same shape and the same size. Congruent line segments are segments that have the same length. Congruent sides and segments are marked with an equal number of tick marks.

Identify the line segments that are congruent.



$\overline{BC} \cong \overline{WZ}$ one tick mark
$\overline{AC} \cong \overline{YZ}$ two tick marks

Family Letter

Section A continued

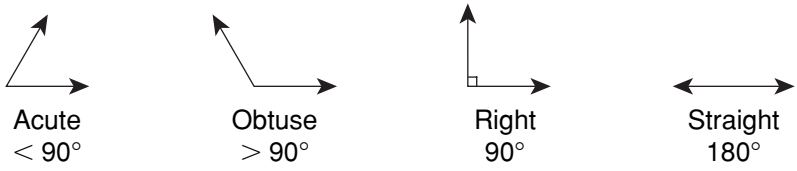
straight angle an angle that measures exactly 180°

supplementary angles two angles whose measures have a sum of 180°

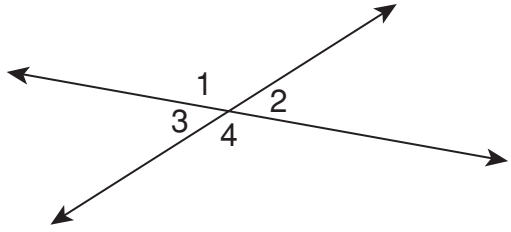
vertex the common endpoint formed by two rays

vertical angles a pair of opposite congruent angles formed by intersecting lines

The student will learn to measure and draw angles with a protractor. He or she will also recognize and classify angles into four different categories: **acute, obtuse, right,** and **straight.**



The student will learn about angle relationships and how to find angle measures. Angles are congruent if they have the same measure. **Adjacent angles** are two angles that are side by side and have a common vertex and ray. **Vertical angles** are two angles formed by two intersecting lines and are not adjacent. Vertical angles are always congruent.



∠3 and ∠1 are adjacent angles.

Name the three other pairs of adjacent angles.
∠3 and ∠4; ∠4 and ∠2; ∠1 and ∠2

∠1 and ∠4 are vertical angles.

Name the second pair of vertical angles.
∠3 and ∠2

Complementary angles are two angles whose measures have a sum of 90˚. **Supplementary angles** are two angles whose measures have a sum of 180˚.

The information covered in this section will provide a strong foundation for the geometric concepts and applications the student will be using throughout this chapter and future mathematics courses.

Sincerely,

CHAPTER 9

Family Letter

Section B

What We Are Learning

Polygons

Vocabulary

These are the math words we are learning:

acute triangle a triangle with all angles less than 90°

equilateral triangle a triangle with three congruent sides

isosceles triangle a triangle where at least two sides are congruent

obtuse triangle a triangle with exactly one obtuse angle

parallelogram a quadrilateral with two pairs of parallel sides

polygon a closed plane figure formed by three or more line segments

rectangle a parallelogram with four right angles

regular polygon a polygon whose sides and angles are all congruent

rhombus a parallelogram with four congruent sides

right triangle a triangle with exactly one right angle

scalene triangle a triangle with no congruent sides

Side-Side-Side Rule two triangles are congruent when all three corresponding sides are congruent

Dear Family,

In this section, the student will be learning about polygons. A **polygon** is a closed plane figure bounded by at least three or more line segments. The line segments are called sides, and each point at which the line segments meet is called a vertex. The student will learn to identify polygons and justify why a figure is or is not a polygon.

Determine whether each figure is a polygon. Explain your answer.

A B C D

A. This figure is a polygon. It is a closed figure with 6 sides.

B. This figure is not a polygon. The sides of a polygon must be line segments.

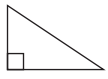
C. This figure is not a polygon. The sides of a polygon cannot intersect, except at each vertex.

D. This figure is not a polygon. A polygon must be a closed figure.

The student will learn to classify polygons and to identify them as regular or irregular. A **regular polygon** is a polygon whose sides are congruent and whose angles are congruent. A stop sign is an example of a regular polygon.

Triangles and quadrilaterals are two special groups of polygons. Triangles can be classified by the lengths of their sides and by the measures of their angles.

Classify each triangle according to its sides and angles.



scalene no congruent sides
right one right angle
This is a scalene right triangle.

isosceles 2 congruent sides
acute all acute angles
This is an isosceles acute triangle.

The student will learn to find unknown angle measures in triangles. The sum of the measures of the angles in a triangle is 180°.

Family Letter

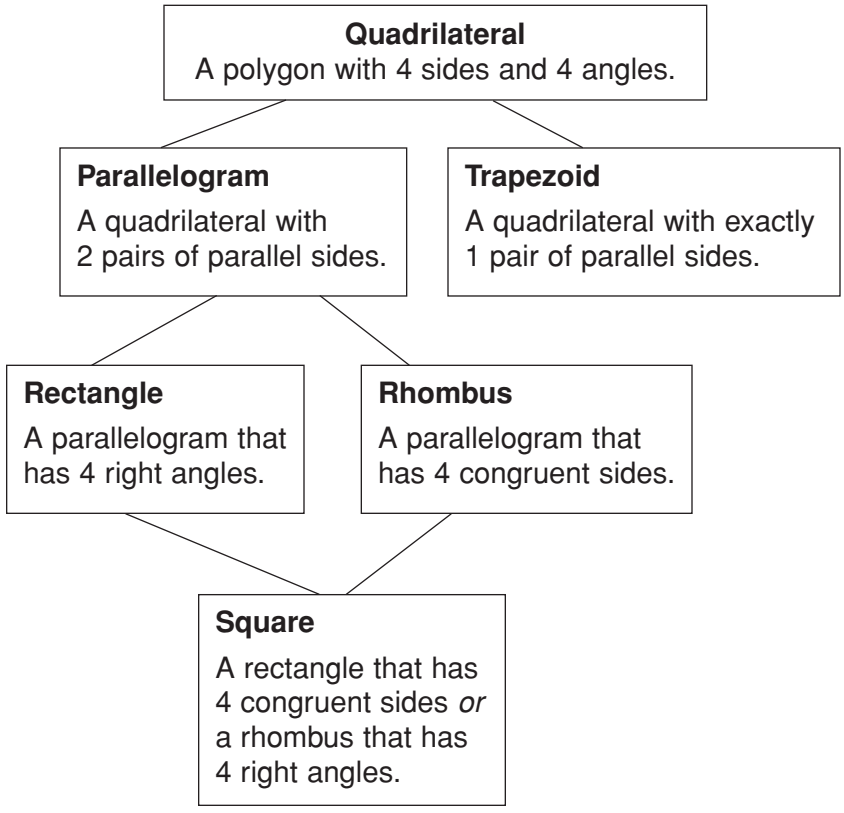
Section B continued

square a rectangle with four congruent sides

trapezoid a quadrilateral with exactly one pair of parallel sides

vertex each endpoint of a polygon

Quadrilaterals are polygons with four sides. Some quadrilaterals may share properties, and therefore, may have more than one name. Use the diagram below to help the student recognize the unique properties of these special quadrilaterals.



Have the student explain the differences and similarities between the closed figures covered in this lesson.

Sincerely,