



Concepts Introduction to Polygons

Based on power point presentations by Pearson Education, Inc.
Revised by Ingrid Stewart, Ph.D.

Learning Objectives

1. Name certain polygons according to the number of sides and find the sum of their angles.
2. Recognize the characteristics of triangles and name certain triangles.
3. Recognize the characteristics of quadrilaterals and name certain quadrilaterals.

NOTE: This lesson contains some examples. You can find more examples in the “Examples” document also located in the appropriate MOM Learning Materials folder.

1. Definition of Polygons (1 of 2)

Polygon

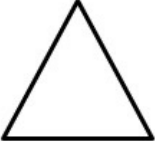
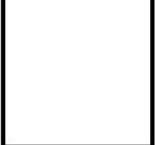
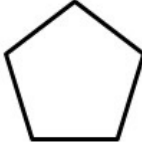
Any closed shape in the plane formed by three or more line segments that intersect only at their endpoints.

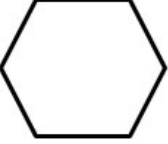

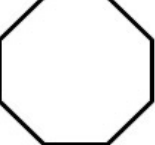
Regular Polygon

Has sides which are all the same length and angles of all the same measure.

Definition of Polygons (2 of 2)

Regular Polygons

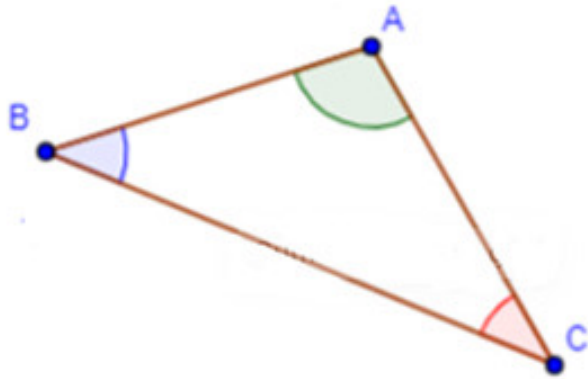
Name	Picture
Triangle 3 sides	
Quadrilateral 4 sides	
Pentagon 5 sides	

Name	Picture
Hexagon 6 sides	
Heptagon 7 sides	
Octagon 8 sides	

The sum of the interior angles of a polygon with n sides is given by $180^\circ(n - 2)$. Note: “Interior angles” are the angles inside a shape!

2. The Triangle (1 of 3)

One of the most important polygons is the 3-sided polygon called a **triangle**. Due to the rigidity of its shapes, physicists proved that the triangle can withstand high amounts of force without being deformed. Therefore, architects and engineers use triangles when building bridges, roofs on houses, and other structures.



Interior Angles of a Triangle

The **interior angles** of a triangle are the angles inside the triangle. The sum of the measures of the three **interior angles** is always 180° .

Sides of a Triangle

The longest side of a triangle is opposite the largest angle and vice versa. The shortest side of a triangle is opposite the smallest angle and vice versa

2. The Triangle (2 of 3)

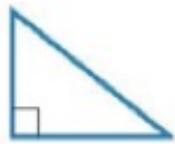
In this lesson, we will discuss six types of triangles.

Acute Triangle

All interior angle measures are greater than 0° but less than 90° .

Right Triangle

One interior angle measure is 90° . This angle, also called right angle, is usually indicated by a rectangle as follows:



Obtuse Triangle

One interior angle measure is more than 90° but less than 180° .

2. The Triangle (3 of 3)

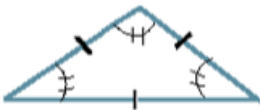
Isosceles Triangle

Two sides of this triangle have equal length and interior angles opposite these sides have equal measure.



Equilateral Triangle

All sides of this triangle have equal length and all interior angles measures are 60° .



Scalene Triangle

A scalene triangle can be defined as a triangle whose three sides have different lengths, and all three angles are of different measures.

3. The Quadrilaterals (1 of 2)

Another important polygon is the 4-sided polygon called a **quadrilateral**. In this lesson, we will discuss five types of quadrilaterals.

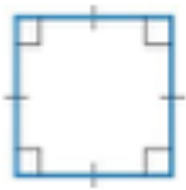
Rectangle

Both pairs of opposite sides are parallel, and each pair has the same measure. All interior angles are right angles.



Square

A rectangle with all sides having equal length.



The Quadrilaterals (2 of 2)

Parallelogram

In a parallelogram, both pairs of opposite sides are parallel and have the same measure. Opposite interior angles have the same measure. No interior angles are right angles.



Rhombus

A rhombus is a special parallelogram where all sides having equal lengths.



Trapezoid

A trapezoid has exactly one pair of parallel sides.

