

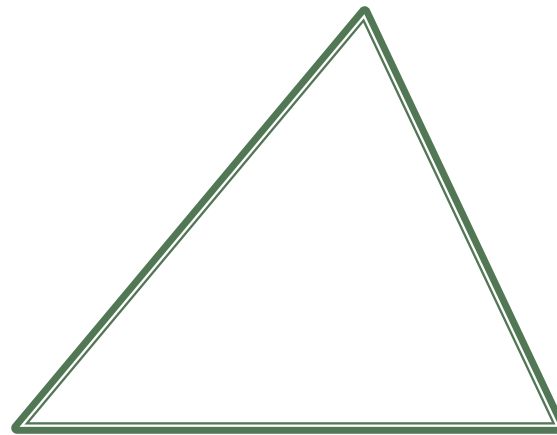
Triangle



Department of Mathematics Education
Faculty of Mathematics and Science YSU
2014

Triangle

- ❑ A *triangle* is a closed figure in a plane, formed by connecting three line segments endpoint to endpoint with each segment intersecting exactly two others.
- ❑ Each line segment is called a side of the triangle. Each endpoint where the sides meet is called a vertex of the triangle

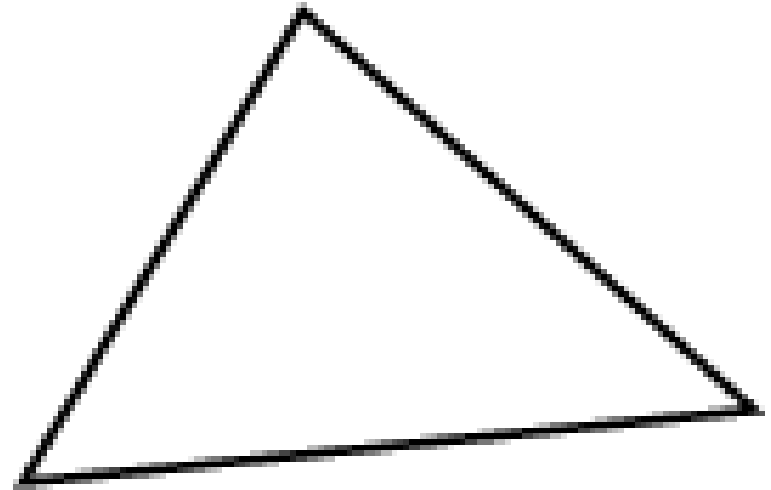


Classifying Triangles

Triangles are classified according to the equality of the length of their sides or according to the kind of angles they have

Acute Triangles

A triangle in which all three angles are less than 90° .



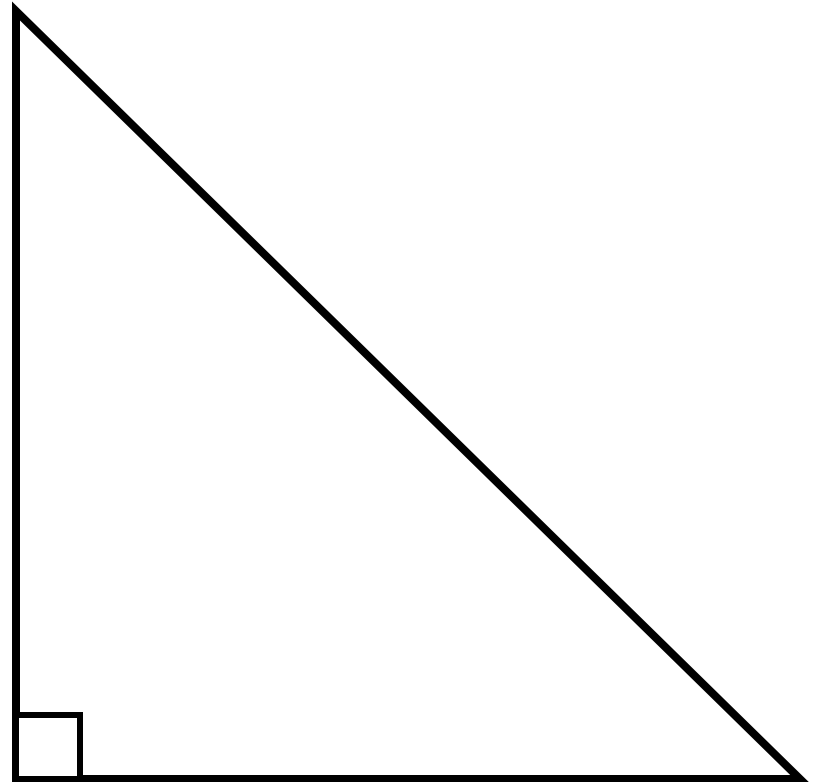
Obtuse Triangles

An obtuse triangle is a triangle in which one of the angles is greater than 90° .



Right Triangles

A right triangle is a triangle with an angle of 90° .



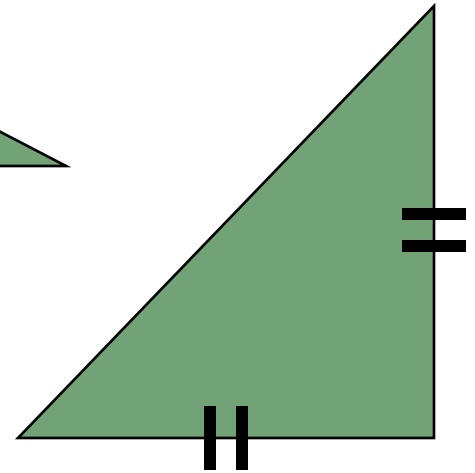
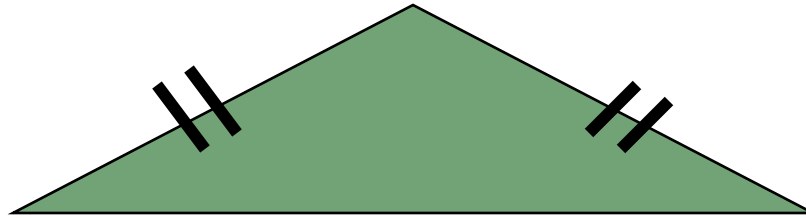
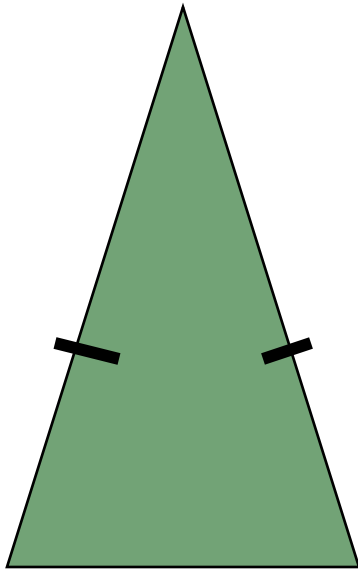
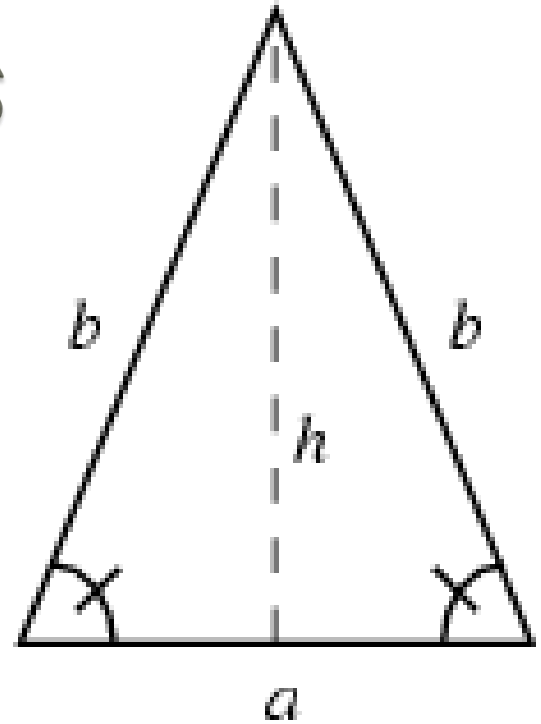
Scalene Triangles

A triangle with three unequal sides.



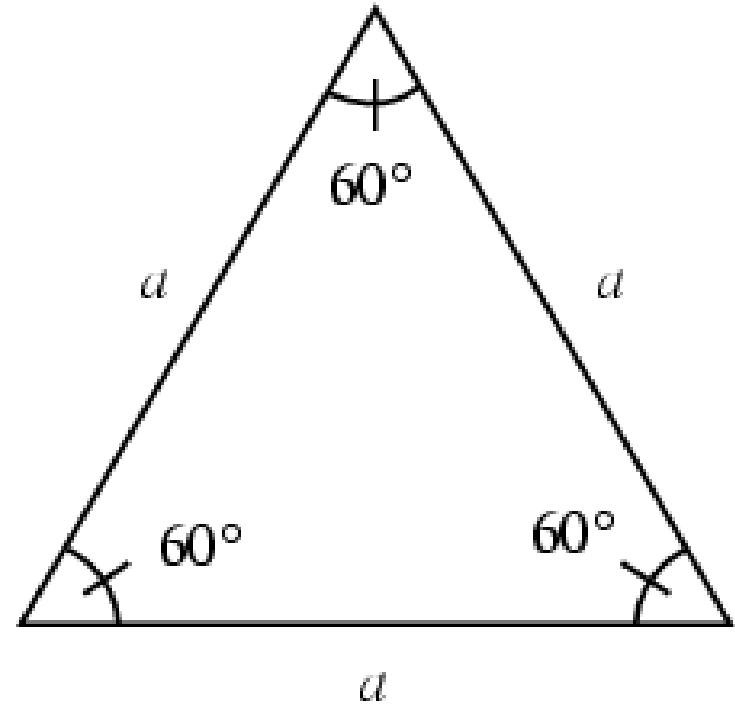
Isosceles Triangles

An isosceles triangle is a triangle with (at least) two equal sides.



Equilateral Triangles

An equilateral triangle is a triangle with all three sides of equal length.

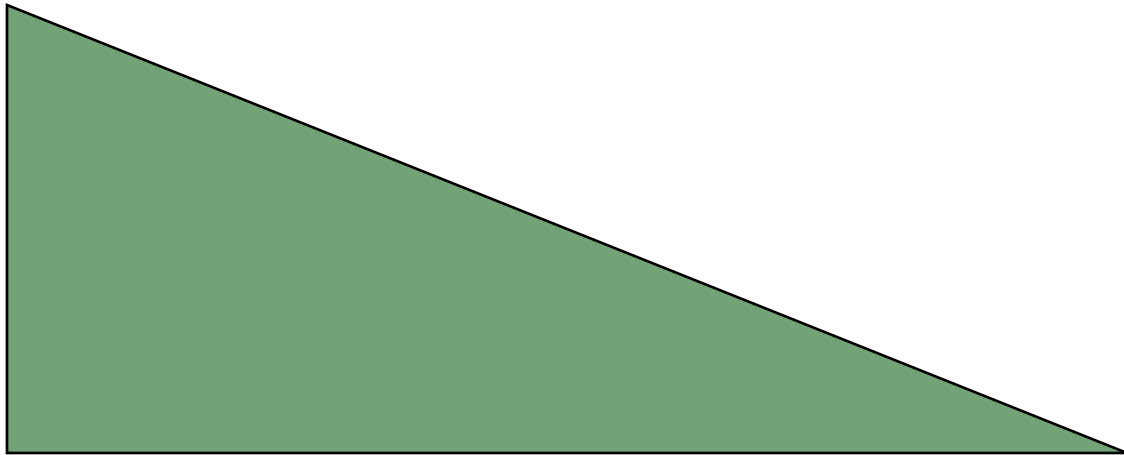


Triangles

Can be classified by
the number of congruent
sides

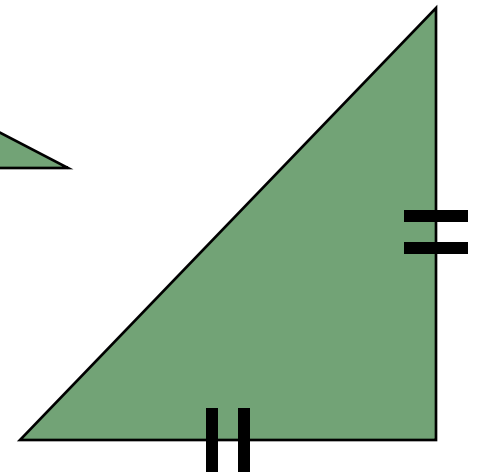
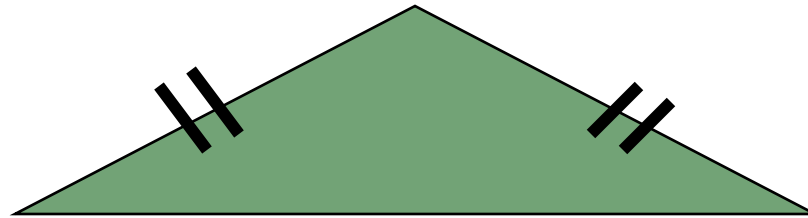
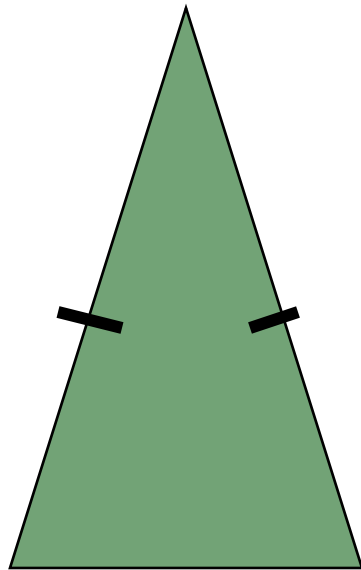
Scalene Triangle

Has no congruent sides



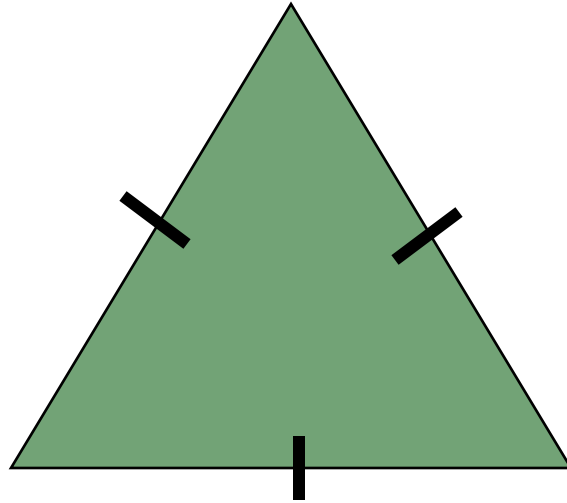
Isosceles Triangle

Has at least two congruent sides



Equilateral Triangle

Has three congruent sides

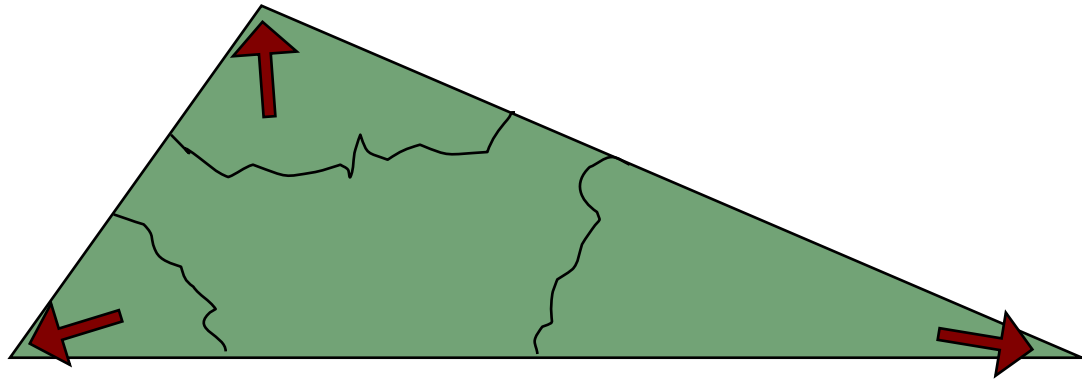


Triangles

Cut any shape triangle
out of a sheet of paper

Triangles

Tear off the corners. Piece them together by having the corners touch.



Triangles

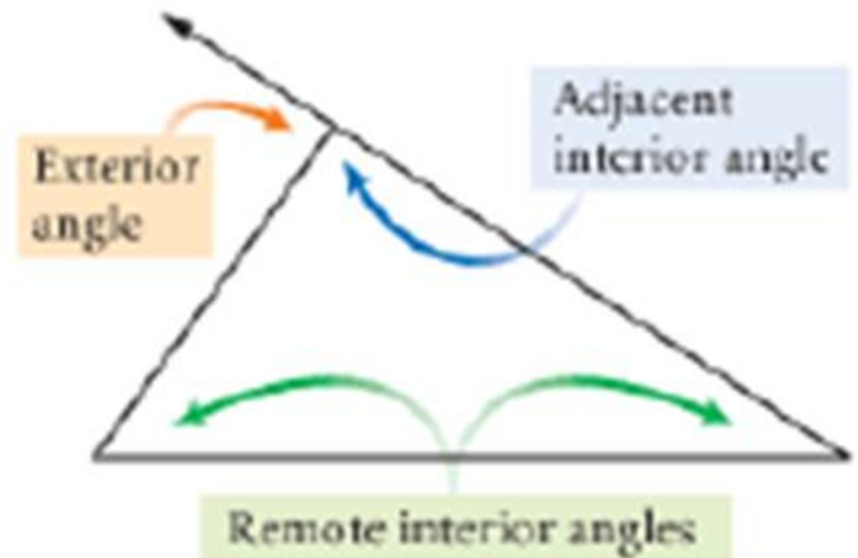
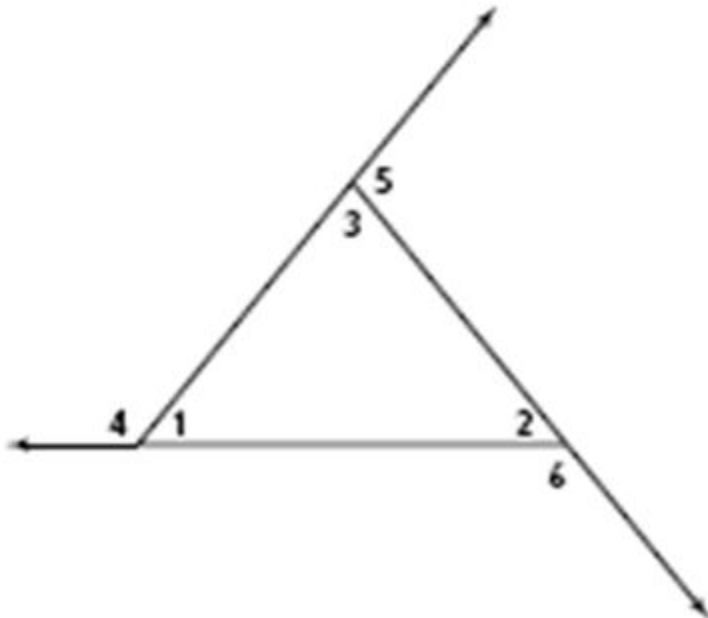
The corners form
what type of
angle?

Triangles

The sum of the
angles of a
triangle is 180
degrees

Remote Interior Angles

- The non adjacent interior angles are called the *remote interior angles* with respect to an exterior angle. In the following figure, $\angle 4$, $\angle 5$, and $\angle 6$ are exterior angles

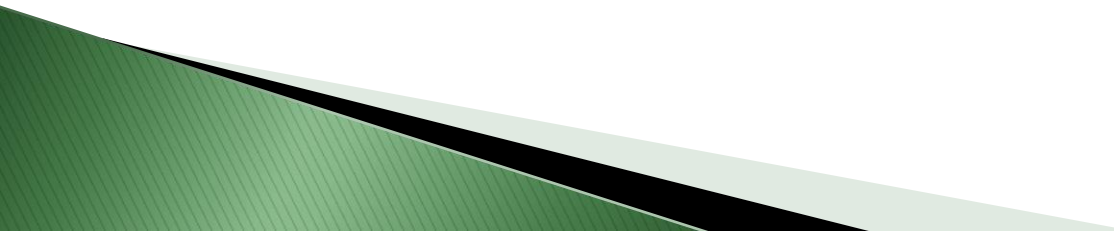


Theorem

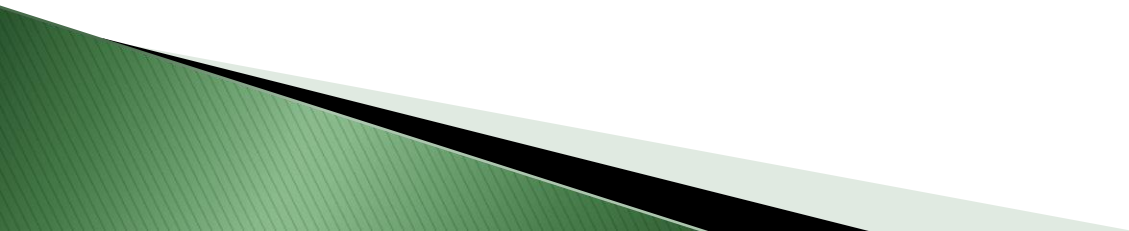
An exterior angle of a triangle is equal to the sum of the remote interior angles

Congruent Triangles

Have the same **SIZE**
and the same **SHAPE**

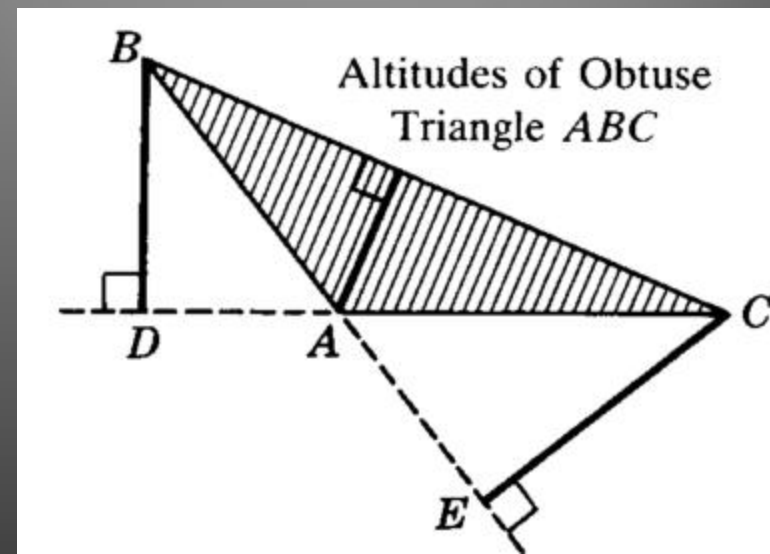
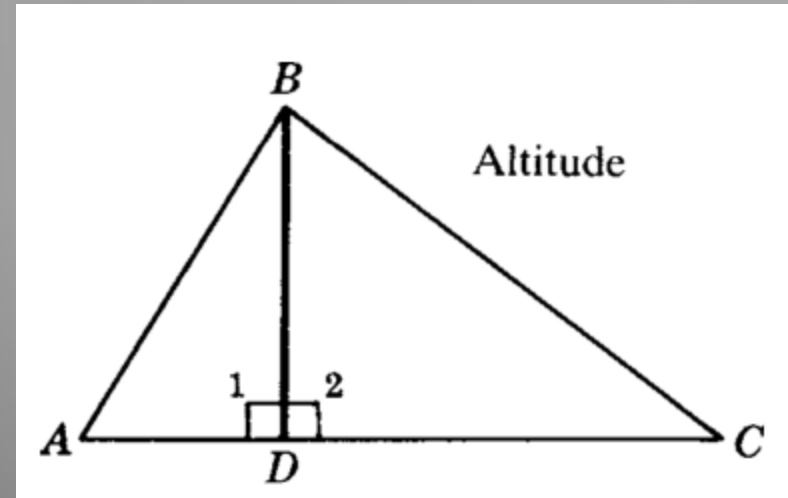


Special Lines in a Triangle



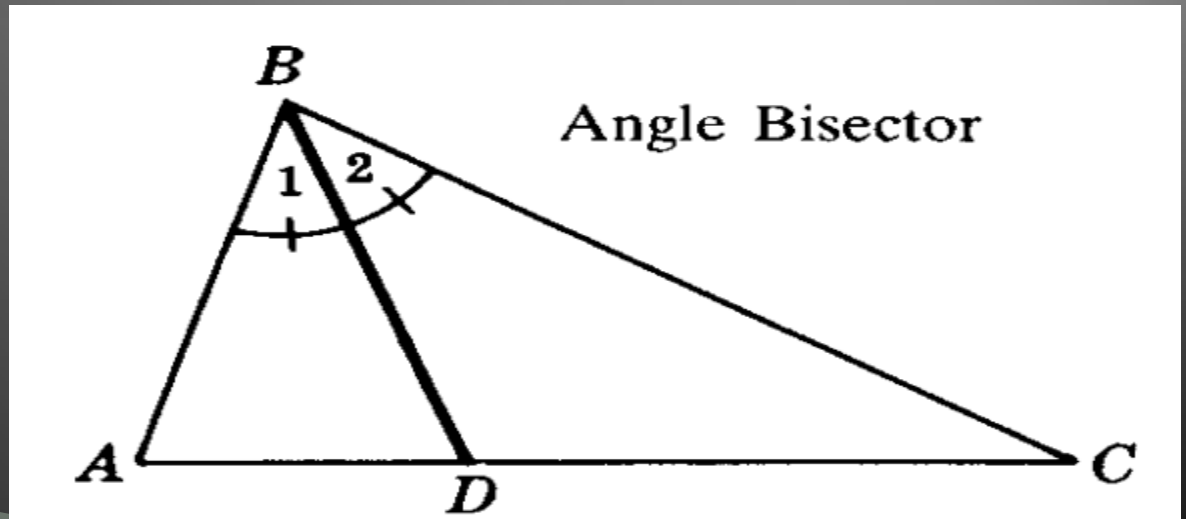
Altitude

- ▶ *Altitude* to a side of a triangle. An altitude of a triangle is a segment from a vertex perpendicular to the opposite side.
- ▶ *Altitude of a obtuse triangle.* In an obtuse triangle, the altitude drawn to either side of the obtuse angle falls outside the triangle



Angle Bisector

An angle bisector of a triangle is a segment or ray that bisects an angle and extends to the opposite side. In every triangle, the three angle bisectors intersect at a single point inside the triangle



Median and Perpendicular Bisector

- *Median* of a triangle. A median of a triangle is a segment from a vertex to the midpoint of the opposite side. Every triangle has three medians. In every triangle, all three medians intersect at a single point inside the triangle
- *Perpendicular bisector* of a side. A perpendicular bisector of a side of a triangle is a line that bisect and is perpendicular to a side

