

Geometry Info Sheet #22

Polygon and Triangle Congruence

Definitions

Polygon: A two-dimensional closed plane figure made up of at least three straight line segments (no curves) such that each segment intersects exactly two other segments; the line segments are the sides of the polygon, and the common endpoints of the segments are the vertices

When naming polygons, the rule is to go around the figure, either clockwise or counterclockwise, and list the vertices in order. It does not matter which vertex is listed first.

Interior Angle: An angle inside a polygon formed by two adjacent sides of the figure; the number of interior angles in a polygon is the same as the number of sides of the polygon

Exterior Angle: The angle formed by extending a side of a polygon; each exterior angle forms a linear pair with an interior angle; the number of exterior angles in a polygon is twice the number of sides of the polygon

Two geometric figures are congruent if and only if a rigid motion (or composition of rigid motions) maps one figure onto the other. A rigid motion maps each part of a pre-image onto a corresponding part of its image. Since rigid motions preserve length and angle measure, corresponding parts of congruent figures are congruent. In congruent polygons, this means that the corresponding sides are congruent, and the corresponding angles are congruent.

Postulates

Polygon Congruence Postulate: Two polygons are congruent if and only if there is a correspondence between their sides and their angles such that:

- 1) Each pair of corresponding angles is congruent.
- 2) Each pair of corresponding sides is congruent.

Congruent polygons are the same shape and the same size.

Theorems

Triangle Sum Theorem: The sum of the measures of the three interior angles of a triangle is 180 degrees.

Exterior Angle Theorem: The measure of an exterior angle of a triangle is equal to the sum of the measures of the remote (non-adjacent) interior angles.

Third Angle Theorem: If two angles of one triangle are congruent to two angles of another triangle, then the third angles of the triangles are also congruent.