

Geometry Info Sheet #46

Areas of Rhombuses, Kites, and Regular Polygons

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

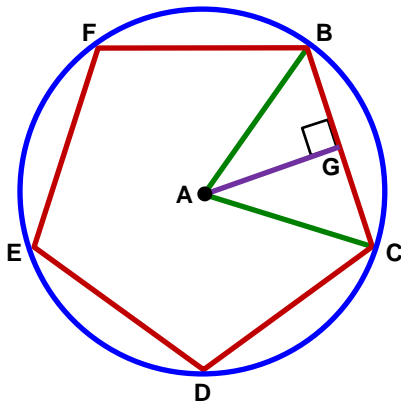
A diagonal of a polygon is a segment that joins two non-adjacent vertices.

Regular Polygon: A polygon in which all of the sides are congruent and all of the angles are congruent

A central angle of a regular polygon is an angle whose vertex is the center of the polygon and whose sides pass through two consecutive vertices of the polygon.

Apothem: A line segment from the center of a regular polygon to the midpoint of any side, forming a right angle

The center and radius of a regular polygon are the center and radius of the polygon's circumscribed circle.



Circle A is circumscribed about the regular polygon BCDEF.

Center: A

Radii: \overline{AB} and \overline{AC}

Apothem: \overline{AG}

Central Angle: $\angle BAC$

Formulas

The area A of a rhombus or a kite with diagonals d_1 and d_2 is given by: $A = \frac{1}{2}d_1d_2$

The area A of a regular polygon with apothem a and perimeter p is given by: $A = \frac{1}{2}ap$

The measure of a central angle of a regular polygon with n sides is: $\frac{360^\circ}{n}$