

Geometry Info Sheet #42

Inscribed Angles, Intercepted Arcs, and Polygons in Circles

Definitions

- Circle:** The set of all points in a plane equidistant from a given point (the center)
- Chord:** A line segment whose endpoints lie on a circle
- Diameter:** A chord which passes through the center of a circle
- Arc:** A curved, unbroken section of a circle
- Semicircle:** An arc whose endpoints are the endpoints of a diameter of the same circle
- Intercepted Arc:** On a circle, an arc whose endpoints are on the sides of an angle whose vertex is on or inside the circle; the remaining points of the arc lie in the interior of the angle
- Inscribed Angle:** An angle whose vertex is on a circle and whose sides contain chords of the circle
- Inscribed Polygon:** A polygon that is fully contained within another figure, with all of its vertices lying on the figure; for a polygon inscribed in a circle, all of its vertices lie on the circle
- Circumscribed Circle:** Also known as a circumcircle; a circle on the outside of a polygon that contains all of the vertices of the polygon

Theorems

Inscribed Angle Theorem: In a circle, the measure of an inscribed angle is half the measure of its intercepted arc.

Corollaries to Inscribed Angle Theorem

In a circle, two inscribed angles that intercept the same arc are congruent.

In a circle, an inscribed angle that intercepts a semicircle is a right angle.

For a right triangle inscribed in a circle, the hypotenuse of the triangle is a diameter of the circle.

The opposite angles of a quadrilateral inscribed in a circle are supplementary.