

# Geometry Info Sheet #41

## Arcs, Chords, and Congruence in Circles

### Definitions

**Circle:** The set of all points in a plane equidistant from a given point (the center)

**Radius:** A line segment from the center of a circle to any point on the circle

**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

**Minor Arc:** An arc that is shorter than a semicircle of the same circle

For a minor arc on a circle, the corresponding chord of that arc is the chord whose endpoints match the endpoints of the arc. For a chord with endpoints on a circle, its corresponding arc is the minor arc whose endpoints match those of the chord.

### Theorems

In a circle:

- 1) A radius (or diameter) that is perpendicular to a chord bisects the chord and its corresponding arc.
- 2) A radius (or diameter) that bisects a chord (that is not a diameter) is perpendicular to the chord.
- 3) A perpendicular bisector of a chord passes through the center of the circle.

In the same circle or in congruent circles:

- 1) The corresponding arcs of congruent chords are congruent.
- 2) The corresponding chords of congruent minor arcs are congruent.

In the same circle or in congruent circles:

- 1) Chords equidistant from the center (or centers) are congruent.
- 2) Congruent chords are equidistant from the center (or centers).