Prove these propositions:

1. If two chords in a circle are congruent, then they determine two central angles that are congruent.

2. The perpendicular bisector of a chord passes through the center of the circle.

3. Two congruent chords in a circle are equidistant from the center of the circle.

4. Given an inscribed angle one of whose sides is a diameter of the circle, then the corresponding central angle is twice as large as the inscribed angle.