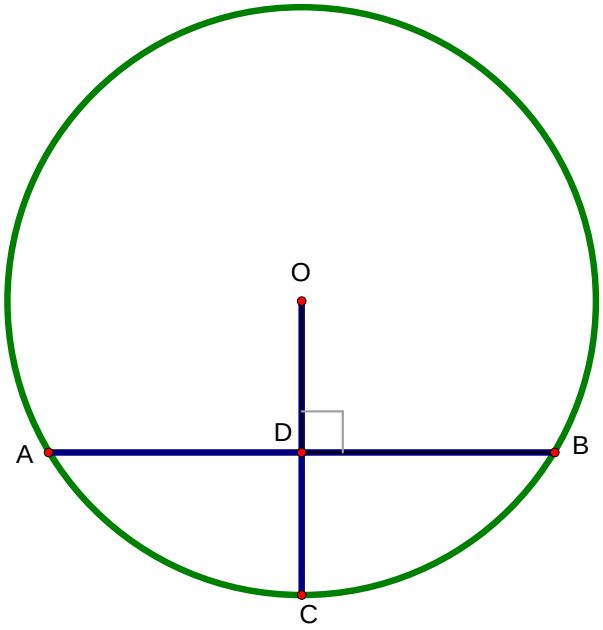
Theorem 6.1.1

If a radius is perpendicular to a chord, then it bisects the chord.



Given: $\odot O$, $\overline{OC} \perp \overline{AB}$

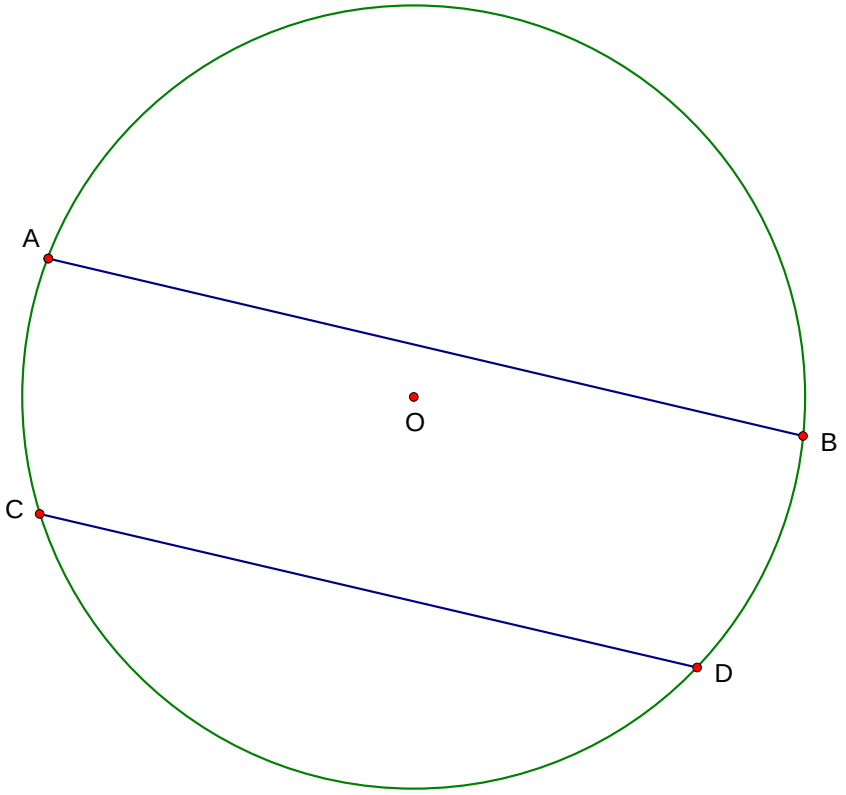
Prove: $\overline{AD} \cong \overline{DB}$

Proof:

STATEMENTS	**REASONS**
1. $\odot O$, $\overline{OC} \perp \overline{AB}$	1. Given
2. Draw $\overline{OA}$ and $\overline{OB}$	2. Two points determine a line.
3. $\overline{OA} \cong \overline{OB}$	3. Radii of a circle are $\cong$
4. $\overline{OD} \cong \overline{OD}$	4. Identity
5. $\measuredangle ODA$ and $\measuredangle ODB$	5. Perpendicular lines form right $\measuredangle s$
6. $\Delta ODA \cong \Delta ODB$	6. HL
7. $\overline{AD} \cong \overline{DB}$	7. CPCTC

Theorem 6.2.8

If two parallel lines intersect a circle, the intercepted arcs between these lines are congruent.



Given: $\odot O$, $\overline{AB} \parallel \overline{CD}$

Prove: $\overset{\frown}{AC} \cong \overset{\frown}{BD}$

Proof:

STATEMENTS	**REASONS**
1. $\odot O$, $\overline{AB} \parallel \overline{CD}$	1. Given
2. Draw $\overline{AD}$	2. Two points determine a line.
3. $\measuredangle CDA \cong \measuredangle BAD$	3. ITPLACBAT then alternate interior angles are congruent.
4. $m\angle CDA = m\measuredangle BAD$	4. $\cong \measuredangle s$ have = measures
5. $m\measuredangle CDA = \frac{1}{2} m\overset{\frown}{AC}$, $m\measuredangle BAD = \frac{1}{2} m\overset{\frown}{BD}$	5. Measure of inscribed angle is half the measure of intercepted arc.
6. $\frac{1}{2} m\overset{\frown}{AC} = \frac{1}{2} m\overset{\frown}{BD}$	6. Substitution (5) into (4)
7. $m\overset{\frown}{AC} = m\overset{\frown}{BD}$	7. Multiplication Property
8. $\overset{\frown}{AC} \cong \overset{\frown}{BD}$	8. Arcs with = measures are congruent