Homework Assignment 4 and Proofs

1. **Section 3.8:** 1, 4

**Proofs:**

1. The interior of a circle is a convex set.

2. Let $\overline{ABC}$ be an arc of circle $O$.

   (a) Prove that if $\overline{ABC}$ is a minor arc, then $O$ and $B$ are on opposite sides of $\overline{AC}$.

   (b) Prove that if $\overline{ABC}$ is a major arc, then $O$ and $B$ are the same side of $\overline{AC}$.

3. Prove that a line passing through the center of a circle that is perpendicular to a chord bisects that chord.

4. Let $P$ be external to $\odot O$. If $\overline{PA}$ and $\overline{PB}$ are tangents to $\odot O$ at $A$ and $B$ respectively, then $\overline{PA} \cong \overline{PB}$.