SKILLS TO AQUIRE

- Find lengths using properties of perpendicular bisectors.
- Write proof arguments using properties of reflections.
- Use the Perpendicular Bisector Theorem in real situations.

REVIEW Proof:

Given: \( \odot O \cong \odot P \)
\( OA = PC \)

Proof: \( OB = PR \)

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**Definition:** Perpendicular Bisector Theorem: If a point is on the **PERPENDICULAR BISECTOR** of a segment, then it is **EQUIDISTANT** from the endpoints of the segment.

Given: \( m \) is the perpendicular bisector of \( XY \)
\( n \) is the perpendicular bisector of \( YZ \)

Prove: \( X, Y, \) and \( Z \) lie on \( \odot O \) with radius \( OX \).
1.) \( m \) is the ⊥ bisector of AB at the picture at the right.

   a.) Name 2 pairs of congruent segments.

   \[\overline{AC} \text{ and } \overline{AB} \quad \overline{AP} \text{ and } \overline{BP}\]

   b.) If \( AP = 10 \), then \( BP = 10 \).

   c.) If \( AB = 10 \), then \( AC = 5 \)

2.) A tree stands midway between two states. Guy wires are attached from the states to a narrow collar around the trunk. Explain why the guy wires must have the same length. Use picture to better understand.

Look at the picture:

The tree is acting as a perpendicular bisector to the ground. Since the guy wires are attached to the tree at the same spot, and since the tree is the midway point between the two stakes, they must be the same distance to the ground.