



But $\angle 3 + \angle 4 = 180^\circ$ (linear pair axiom)

$$2\angle 3 = 180^\circ$$

$$\Rightarrow \angle 3 = 90^\circ$$

AC is perpendicular bisector of BC

$$\left[\begin{array}{l} \angle 3 = 90^\circ \\ BO = DO \end{array} \right]$$

To prove AC is per. bisector of BD

Proof In $\triangle ABC$ and $\triangle ADC$

$$AB = AD \text{ [given]}$$

$$BC = CD$$

$$AC = AC$$

$\therefore \triangle ABC \cong \triangle ADC$ by SSS prop.

$$\angle 1 = \angle 2 \text{ (cpct)}$$

In $\triangle AOB$ and $\triangle AOD$

$$AB = AD \text{ (given)}$$

$$\angle 1 = \angle 2 \text{ (proved)}$$

$$AO = AO$$

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$\therefore \triangle AOB \cong \triangle AOD$ by SAS prop

$$BO = DO \text{ (cpct)}$$

$$\angle 3 = \angle 4$$