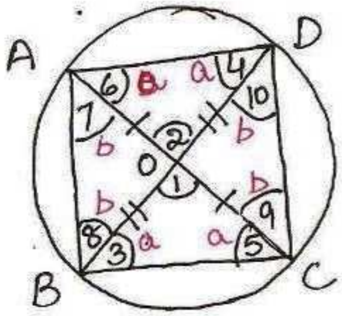
Alternate Solution




**Chords AC and BD of a circle bisect each other. Prove AC and BD are diameters and quadrilateral ABCD is a rectangle.**

to prove AC and BD are diameters
□ ABCD is a rectangle

proof In $\triangle BOC$ and $\triangle DOA$

$OB = OD$ (given)

$\angle 1 = \angle 2$ (vert. opp. ∠s)

$OC = OA$ (given)

$\therefore \triangle BOC \cong \triangle DOA$ by SAS property

$\angle 3 = \angle 4 \cdots$ (I) (cpct)

$\angle 5 = \angle 6 \cdots$ (II)

$\angle 3 = \angle 6 \cdots$ (III) (angles in same segment)

$\angle 4 = \angle 5 \cdots$ (IV)

$\angle 3 = \angle 4 = \angle 5 = \angle 6$ (From (I), (II), (III), (IV))

let $\angle 3 = \angle 4 = \angle 5 = \angle 6 = a^\circ$

Sim $\angle 7 = \angle 8 = \angle 9 = \angle 10$

let $\angle 7 = \angle 8 = \angle 9 = \angle 10 = b^\circ$

$\angle A = \angle C$ (each $a+b$)

But $\angle A + \angle C = 180^\circ$ (opp. angles of cyclic □)

$\therefore 2\angle A = 180^\circ$

$\angle A = 90^\circ$

$\therefore$ BD is diameter of ⊙

Sim AC is diameter of ⊙

$\angle A = \angle B = \angle C = \angle D$ (each $a+b$)

$\therefore$ □ ABCD is a rectangle