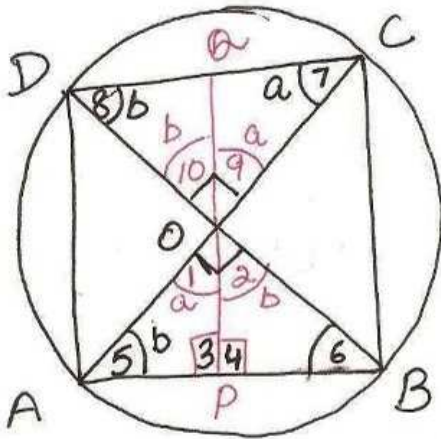


CBSE HOTS class ix, Circles 3 Solution by Dev Anoop (Bathinda)



Diagonals of a cyclic quadrilateral are perpendicular to each other. Prove that the perpendicular from their point of intersection on any side when produced backwards bisects the opposite side.

given - In figure $AC \perp BD$, $OP \perp AB$,
 PO is produced to intersect
 DC at P

to prove PQ bisects DC

proof $\angle AOB = 90^\circ$ [$AC \perp BD$]

$$\angle 1 + \angle 2 = 90^\circ$$

$$\text{let } \angle 1 = a, \angle 2 = b$$

$$a + b = 90 \dots \textcircled{1}$$

In $\triangle APO$

$$\angle 1 + \angle 5 = 90^\circ$$

$$[\because \angle 3 = 90^\circ]$$

$$a + \angle 5 = 90^\circ \dots \textcircled{11}$$

From $\textcircled{1}$ and $\textcircled{11}$

$$a + \angle 5 = a + b$$

$$\Rightarrow \angle 5 = b$$

Solution by Dev Anoop (Bathinda)

Sim. $\angle 6 = a$

$$\angle 9 = \angle 1 = a$$

$$\angle 10 = \angle 2 = b$$

$$\angle 7 = \angle 6 = a$$

$$\angle 8 = \angle 5 = b$$

[vert. opp. \angle s]

[angles in
 Same Segment]