

Exercise 9A

Question 7:

Given: Asquare ABCD in which ∠PQR = 90° and PB = QC = DR

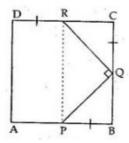
ToProve:(i)

QB = RC

(ii)

PQ = QR

(iii) ∠QPR = 45°



Proof:

(i) Consider the line segement QB:

$$QB = BC - QC$$

$$QB = RC$$
(1)

(ii)In ΔPBQ and ΔQCR, we have

PB = QC

[Given]

 $\angle PBQ = \angle QCR = 90^{\circ}$

[.:.ABCDisasquare]

and

QB = RC

[from (1)]

Thus by Side-Angle-Side criterion of congruence, we have

 $\Delta \mathsf{PBQ} \cong \Delta \mathsf{QCR}$

[By SAS]

 \Rightarrow

PQ = QR

[By cp.c.t]

(iii) Given that, PQ = QR

So, in ΔPQR

 $\angle QPR = \angle QRP$

[isosceles triangle, so base

angles are equal]

By the angle sum property, in ΔPQR

$$\angle QPR + \angle QRP + 90^{\circ} = 180^{\circ}$$

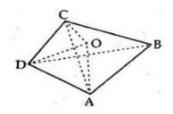
$$\Rightarrow \angle QPR + \angle QPR = 180^{\circ} - 90^{\circ} = 90^{\circ}$$

$$\angle QPR = \frac{90}{2} = 45^{\circ}.$$

Question 8:

...

Given: O is a point within a quadrilateral ABCD



To Prove: OA + OB + OC + OD > AC + BD

Construction: Join AC and BD

Proof: In $\triangle ACO$, OA + OC > AC

...(i)

 $[\because$ in a tringle, sum of any two sides is greater than the third side]

Similarly, In ABOD,

OB + OD > BD

...(ii)

Addingboth sides of (i) and (ii), we get;

OA + OC + OB + OD > AC + BD

(Proved)

********* END ********