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One of the interior angles of quadrilateral ABCD is a right angle. Thus, we have obtained that ABCD is a parallelogram, $AB = BC = CD = AD$ and one of its interior angles is 90° . Therefore, ABCD is a square.

Question 6:

Diagonal AC of a parallelogram ABCD bisects $\angle A$ (see the given figure). Show that

- It bisects $\angle C$ also,
- ABCD is a rhombus.



Answer:

(i) ABCD is a parallelogram.

$\angle DAC = \angle BCA$ (Alternate interior angles) ... (1)

And, $\angle BAC = \angle DCA$ (Alternate interior angles) ... (2)

However, it is given that AC bisects $\angle A$.

$\angle DAC = \angle BAC$... (3)

From equations (1), (2), and (3), we obtain

$\angle DAC = \angle BCA = \angle BAC = \angle DCA$... (4)

$\angle DCA = \angle BCA$

Hence, AC bisects $\angle C$.

(ii) From equation (4), we obtain

$\angle DAC = \angle DCA$

$\angle DA = \angle DC$ (Side opposite to equal angles are equal)

However, $DA = BC$ and $AB = CD$ (Opposite sides of a parallelogram)

$\angle AB = BC = CD = DA$

Hence, ABCD is a rhombus.

Question 7:

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R S Agarwal Class 9 Maths Solution