MATHS

NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

QUADRILATERALS

Illustrative Examples

1. ABCD is a parallelogram and $\angle A = 60°$. Find the remaining angles.

2. In a parallelogram $ABCD, \angle DAB = 40°$

find the other angles of the parallelogram.

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3. Two adjacent sides of a parallelogram are 4.5

cm and 3 cm. Find its perimeter.

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4. In a parallelogram ABCD, the bisectors of the consecutive angles angleA and angleB intersect at P. Show that $\angle APB = 90°$.

5. In a triangle ABC, AD is the median drawn on the side BC is produced to E such that $AD = ED$ prove that ABEC is a parallelogram.

6. In $\triangle ABC$, D, E and F are the midpoints of sides AB, BC and CA respectively. Show that $\triangle ABC$ is divided into four congruent triangles, when the three midpoints are joined to each other. ($\triangle DEF$ is called medial triangle)

7. l, m and n are three parallel lines intersected by the transversals p and q at A, B, C and D,E, F such that they make equal intercepts AB and BC on the transversal p. Show that the intercepts DE and EF on q are also equal.

8. In the Fig. AD and BE are medians of ΔABC and $BE \| DF$. Prove that $CF = \dfrac{1}{4}AC$.

9. ABC is a triangle and through A, B, C lines are drawn parallel to BC, CA and AB respectively intersecting at P, Q and R. Prove

that the perimeter of $\triangle PQR$ is double the perimeter of $\triangle ABC$.

Think Discuss And Write

1. Show that the diagonals of a square are equal and right bisectors of each other.

2. Show that the diagonals of a rhombus divide it four congruent triangles.

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1. State whether the statements are True or False.

(i) Every parallelogram is a trapezium ( )

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2. State whether the statements are True or False.

(ii) All parallelograms are quadrilaterals ( )

3. State whether the statements are True or False.

(iii) All trapeziums are parallelograms ( )

4. State whether the statements are True or False.

(iv) A square is a rhombus ( )

5. State whether the statements are True or False.

(v) Every rhombus is a square ( )

6. State whether the statements are True or False.

(vi) All parallelograms are rectangles

7. The four angles of a quadrilateral are in the ratio 1: 2:3:4. Find the measure of each angle of the quadrilateral.

8. ABCD is a rectangle AC is diagonal. Find the nature of $\triangle ACD$. Give reasons.

Exercise 8 2

1. In the adjacent figure ABCD is a parallelogram ABEF is a rectangle show that $\triangle AFD \cong \triangle BEC$.

2. Show that the diagonals of a rhombus divide it four congruent triangles.

3. If a quadrilateral ABCD, the bisector of $\angle C \angle D$ intersect at O.

Prove that $\angle COD = \dfrac{1}{2}(\angle A + \angle B)$

1. The opposite angles of a parallelogram are $(3x - 2)^\circ$ and $(x + 48)^\circ$.

Find the measure of each angle of the parallelogram.

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2. Find the measure of all the angles of a parallelogram, if one angle is 24° less than the twice of the smallest angle.

3. In the adjacent figure ABCD is a parallelogram and E is the midpoint of the side BC. If DE and AB are produced to meet at F, show that $AF = 2AB.$

4. In the adjacent figure ABCD is a parallelogram P and Q are the midpoints of sides AB and DC

respectively. Show that PBCQ is also a parallelogram.

5. ABC is an isosceles triangle in which $AB = AC$. AD bisects exterior angle QAC and $CD||BA$ as shown in the figure. Show that

(i) $\angle DAC = \angle BCA$

(ii) ABCD is a parallelogram

6. ABCD is a parallelogram AP and CQ are perpendiculars drawn from vertices A and C on diagonal BD (see figure) show that

(i) $\Delta APB \cong \Delta CQD$

(ii) $AP = CQ$

7. In $\Delta^s ABC$ and , $AB||DE, BC = EF$ and $BC||EF$. Vertices A, B and C are joined to vertices D, E and F respectively (see figure). Show that

(i) ABED is a parallelogram

(ii) BCFE is a parallelogram

(iii) AC = DF

(iv) $\Delta ABC \cong \Delta DEF$

8. ABCD is a parallelogram. AC and BD are the diagonals intersect at O. P and Q are the points of tri section of the diagonal BD. Prove that $CQ \; \| AP$ and also AC bisects PQ (see figure).

9. ABCD is a square. E, F, G and H are the mid points of AB, BC, CD and DA respectively. Such that $AE = BF = CG = DH$. Prove that EFGH is a square.

Exercise 8 4

1. ABC is a triangle . D is a point of AB such that $AD = \dfrac{1}{4}AB$ and E is a point on AC such that $AE = \dfrac{1}{4}AC$. If $DE = 2cm$ find BC.

2. ABCD is quadrilateral E, F, G and H are the midpoints of AB, BC, CD and DA respectively. Prove that EFGH is a parallelogram.

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3. Show that the figure formed by joining the midpoints of sides of a rhombus successively is a rectangle.

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4. In a parallelogram ABCD, E and F are the midpoints of the sides AB and DC respectively. Show that the line segments AF and EC trisect the diagonal BD.

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5. Show that the line segments joining the midpoints of the opposite sides of a quadrilateral and bisect each other.

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6. ABC is a triangle right angled at C. A line through the midpoint M of hypotenuse AB and Parallel to BC intersects AC at D. Show that

(i) D is the midpoint of AC

(ii) $MD \perp AC$

(iii) $CM = MA = \dfrac{1}{2}AB.$

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