MATHS

BOOKS - NCERT MATHS (ENGLISH)

QUADRILATERALS

Multiple Choice Questions

1. Three angles of a quadrilateral are $75^\circ, 90^\circ$ and 75°, then the fourth angle is

A. $90°$

B. $95°$

C. $105°$

D. $120°$

Answer: D

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2. A diogonal of a rectangle is inclined to one side of the rectangle at $25°$.

The acute angle between the diagonals is

a) 55 b) 50 c) 40 d)25

A. $55°$

B. $50°$

C. $40°$

D. $25°$

Answer: B

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3. ABCD is a rhombus such that $\angle ACB = 40°$, then $\angle ADB$ is

    A. $40°$

    B. $45°$

    C. $50°$

    D. $60°$

Answer: C

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4. The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rectangle, if

A. PQRS is a rectangle

B. PQRS is parallelogram

C. diagonals of PQRS are perpendicular

D. diagonals of PQRS are equal

Answer: C

5. The quadrilateral formed by joining the mid-points of the side for quadilateral PQRS, taken in order, is a rhombus, if

A. PQRS is a rhombus

B. PQRS is parallelogram

C. diagonals of PQRS are perpendicular

D. diagonals of PQRS are equal

Answer: D

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6. If angles A, B, C and D of the quadrilateral ABCD, taken in order are in the ratio 3 : 7 : 6 : 4, then ABCD is a

A. rhombus

B. parallelogram

C. trapezium

D. kite

Answer: C

7. If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD intersect each other at P, of $\angle B$ and $\angle C$ at Q, of $\angle C$ and $\angle D$ of R and of $\angle D$ and $\angle A$ at S, then PQRS is a (A) Rectangle (B) Rhombus (C) Parallelogram (D) Quadrilateral whose opposite angles are supplementary

    A. rectangle

    B. rhombus

    C. parallelogram

D. quadrilateral whose opposite angles are supplementary

Answer: D

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8. If APB and CQD are two parallel lines, then the bisectors of the angles APQ, BPQ, CQP and PQD form Option1: a square Option2: a rhombus Option3: a rectangle Option4: any other parallelogram

A. a square

B. a rhombus

C. a rectangle

D. any other parallelogram

Answer: C

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9. The figure obtained by joining the mid-points of the sides of a rhombus, taken in order, is Option1 a rhombus Option2 a

rectangle   Option3   a   square   Option4   any

parallelogram

A. a rhombus

B. a rectangle

C. a square

D. any parallelogram

Answer: B

10. D and E are the mid-points of the sides AB and AC of $\triangle$ABC and O is any point on side BC. O is joined to A. If P and Q are the mid-points of OB and OC respectively, then DEQP is Option1 a square Option2 a rectangle Option3 a rhombus Option4 a parallelogram

    A. a square

    B. a rectangle

    C. a rhombus

    D. a parallelogram

Answer: D

11. The figure formed by joining the mid-points of the sides of a quadrilateral ABCD, taken in order, is a square only, if

    A. ABCD is a rhombus

    B. diagnols of ABCD are equal

    C. diagonals of ABCD are equal and perpendicular

D. diagonals of ABCD are perpendicular

Answer: C

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12. a) 24 b) 80 c) 38 d) 32

A. $24°$

B. $86°$

C. $38°$

D. $32°$

Answer: C

13. Which of the following is not true for a parallelogram ?

a) Opposite sides are equal b) Opposite angles are equal

c) Opposite angles are bisected by the diagonals d) Diagonals bisect each other

A. Opposite sides are equal

B. Opposite angles are equal

C. Opposite angles are bisected by the diagonals

D. Diagonals bisect each other

Answer: C

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14. D and E are the mid-points of the side AB and AC, respectively, of △ABC. DE is produced to F. To prove that CF is equal and parallel to

DA, we need an additional information which is

A. $\angle DAE = \angle EFC$

B. AE=EF

C. DE=EF

D. $\angle ADE = \angle ECF$

Answer: C

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Very Short Answer Type Questions

1. Diagonals AC and BD of a parallelogram ABCD intersect each other at O. If OA= 3 cm and OD = 2 cm, determine the lengths of AC and BD.

2. Diagonals of a parallelogram are perpendicular to each other. Is this statement true? Give reason for your answer.

3. Can the angles $110°$, $80°$, $70°$ and $95°$ be the angles of a quadrilateral ? Why or why not?

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4. In quadrilateral ABCD, $\angle A + \angle D = 180°$. What special name can be given to this quadrilateral?

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5. All the angles of a quadrilateral are equal. What special name is given to this quadrilateral ?

6. Diagonals of a rectangle are equal and perpendicular. Is this statement true ? Give reason for your answer.

7. Can all the four angles of a quadrilateral be obtuse angles ? Give reason for your answer.

8. In $\triangle ABC$, AB = 5cm , BC = 8 cm and CA = 7cm. If D and E are respectively the mid-points of AB and BC, determine the length of DE.

9. In the figure, it is given that BDEF and FDCE are parallelogram. Can you say that BD = CD ? Why or why not?
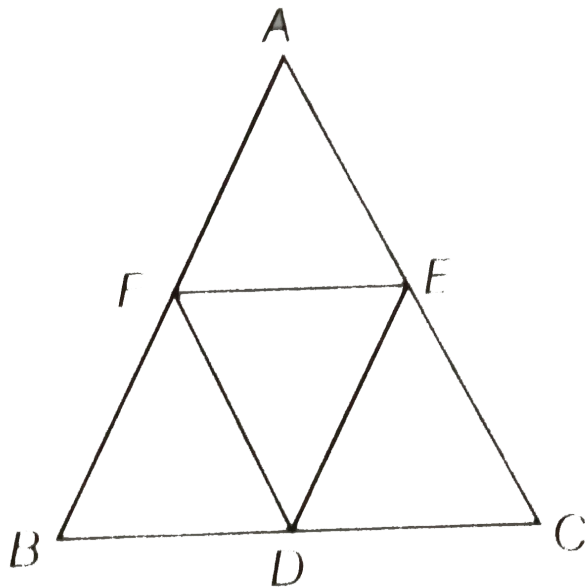
10. In figure, ABCD and AEFG are two parallelograms. If $\angle C = 55°$, then determine $\angle F$.
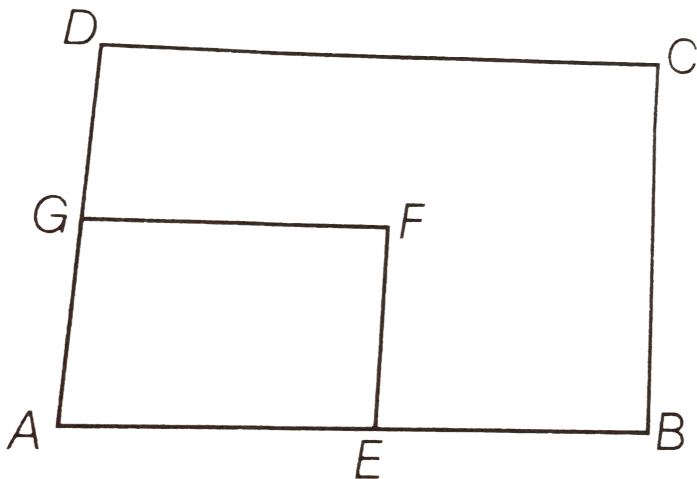
11. Can all the angles of a quadrilateral be acute angles ? Give reason for your answer.

12. Can all the angles of a quadrilateral be right angles ? Give reason for your answer.

13. Diagonals of a quadrilateral ABCD bisect each other. If $\angle A = 35^\circ$, determine $\angle B$.

14. Opposite angles of a quadrilateral ABCD are equal. If AB = 4 cm, determine CD.

Short Answer Type Questions

1. One angle of a quadrilateral is 180^0 and the remaining three angles are equal. Find the three equal angles.

2. ABCD is a trapezium in which $AB | | DC$ and $\angle A = \angle B = 45°$. Find angles C and D of the trapezium.

3. The angle between two altitudes of a parallelogram through the vertex of an obtuse angle of the parallelogram is $60°$. Find the angles of the parallelogram.

4. ABCD is a rhombus in which altitude from D to side AB bisects AB. Find the angles of the rhombus.

**5.** E and F are points on diagonal AC of a parallelogram ABCD such that AE=CF. Show that BFDE is a parallelogram.

6. E is the mid-point of the side AD of the tarapezium ABCD with $AB || DC$. A line through E drawn parallel to AB intersects BC at F. Show that F is the mid-points of BC.

7. Through A, B and C lines RQ, PR and QP have been drawn, respectively parallel to sides BC, CA and AB of a $\triangle ABC$ as shown in figure. Show that $BC = \dfrac{1}{2}QR.$
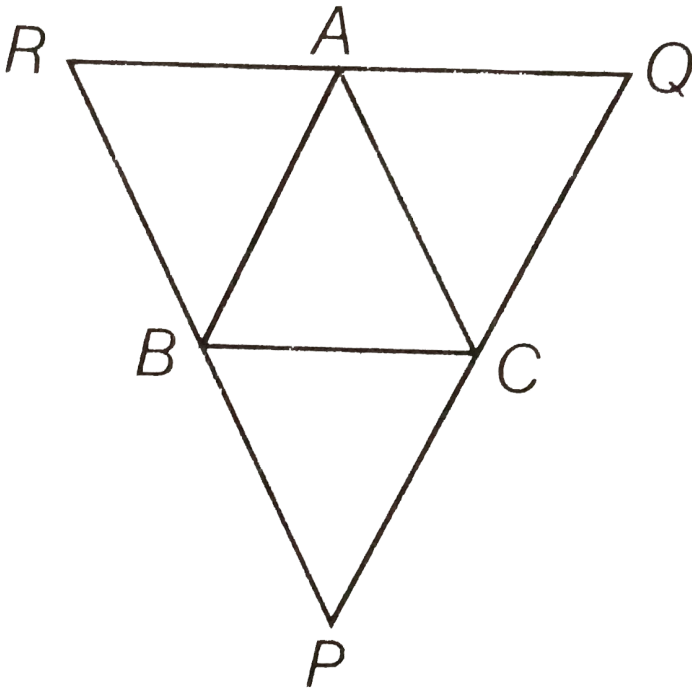
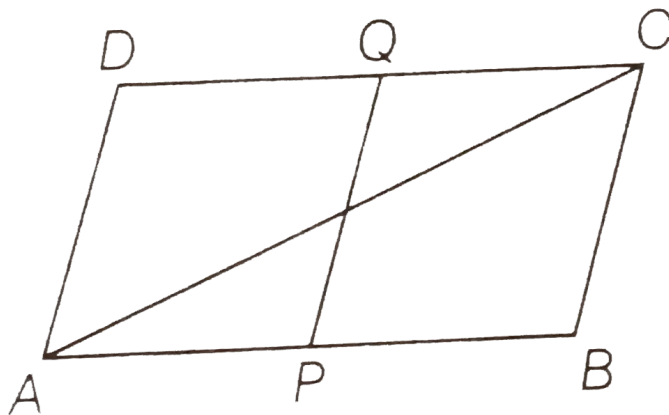**8.** D, E and F are the mid-points of the sides BC, CA and AB, respectively of an equilateral Δ ABC. Show that ΔDEF is also an equilateral triangle.

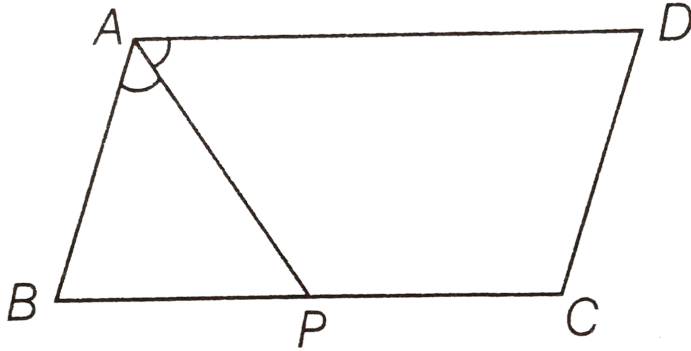**9.** Points P and Q have been taken on opposite sides AB and CD, respectively of a parallelogram ABCD such that AP=CQ. Show

that AC and PQ bisect each other.

10. In figure, P is the mid-point of side BC of a

parallelogram   ABCD   such   that

$\angle BAP = \angle DAP$. Prove that AD = 2CD.

Long Answer Type Questions

1. A square is incribed in an isoceles right triangle, so that the square and the triangle

have one angle common. Show that the vertex of the sqare opposite the vertex of the common angle bisects the hypotenuse.

2. In a parallelogram ABCD, AB = 10 cm and AD = 6 cm. The bisector of $\angle A$ meets DC in E. AE and BC produced meet at F. Find the length of CF.

3. P, Q , R and S are respectively the mid-points of the sides AB, BC, CD and DA of a quadrilateral ABCD in which AC = BD. Prove that PQRS is a rhombus.

4. ABCD is a rhombus and P, Q, R and S are wthe mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rectangle.

5. P, Q, R and S are respectively the mid-points of sides AB, BC, CD and DA of quadrilateral ABCD in which AC=BD and $AC \perp BD$. Prove that PQRS is a square.

6. If diagonal of a parallelogram bisects one of the angles of the parallelogram, it also bisects the second angle.

7. ABCD is a parallelogram in which P and Q are mid-points of opposite sides AB and CD (see Fig. 8.18). If AQ intersects DP at S and BQ intersects CP at R, show that: (i) APCQ is a parallelogram. (ii) DPBQ is a parallelogram.

8. ABCD is a quadrilateral in which AB||DC and AD = BC. Prove that

$\angle A = \angle B$ and $\angle C = \angle D$.

9. In figure, AB||DE, AB=DE, AC||DF and AC=DF.

Prove that BC||EF and BC=EF.
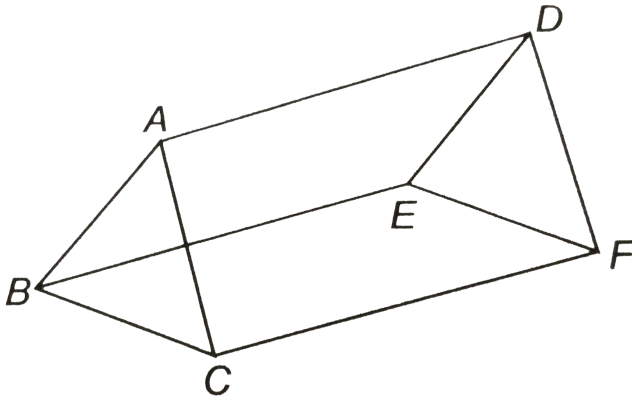
10. In ABC, AD is the median through A and E is the mid-point of AD. BE produced meets AC in F (Figure). Prove that $AF = \dfrac{1}{3}AC$.

11. Show that the quadrilateral, formed by joining the mid-points of the sides of a square, is also a square.
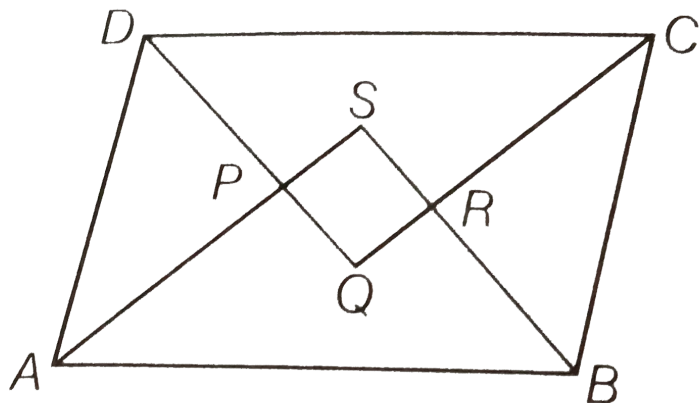
12. In Figure, $ABCD$ isa trapezium in which side AB is a parallel to side DC and E is the mid-point of side $AD.$ If F is a point on the side BC such that the segment EF is parallel to side DC . Prove that F is the mid point of BC and $EF = \dfrac{1}{2}(AB + DC).$

13. Prove that the quadrilateral formed by the bisectors of the angles of a parallelogram is a

rectangle.

14. P and Q are points on opposite sides AD and BC of a parallelogram ABCD such that PQ passes through the point of intersection O of

its diagonals AC and BD. Show that PQ is bisected at O.

15. ABCD is a rectangle in which diagonal BD bisects $\angle B$. Show that ABCD is a square.

16. In $\triangle ABC$, D, E and F are respectively the mid-points of sides AB, BC and CA. Show that

$\triangle ABC$ is divided into four congruent triangles by joining D, E and F.

17. Prove that the line segment joining the mid-points of the diagonals of a trapezium is parallel to each of the parallel sides and is equal to half the difference of these sides.

18. P is the mid-point of the side CD of a parallelogram ABCD. A line through C parallel to PA intersects AB at Q and DA produced at R. Prove that DA = AR and CQ = QR.