MATHS

BOOKS - KUMAR PRAKASHAN KENDRA

MATHS (GUJRATI ENGLISH)

QUADRILATERALS

Sums To Enrich Remember

1. Show that each angle of a rectangle is a right angle.

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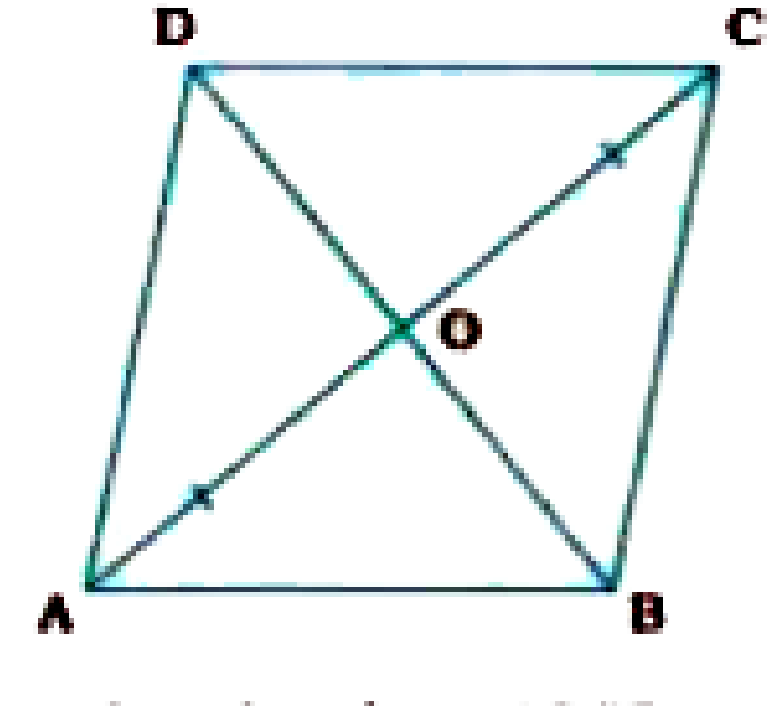
2. Show that the diagonals of a rhombus are perpendicular to each other.



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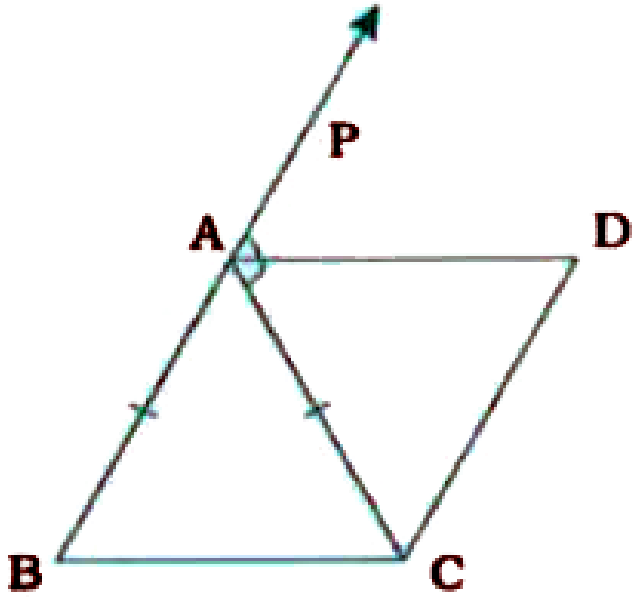
3. ABC is an isosceles triangle in which AB=AC bisects exterior angle PAC and CD||AB (See the given figure). Show that

$\angle DAC = \angle BCA$



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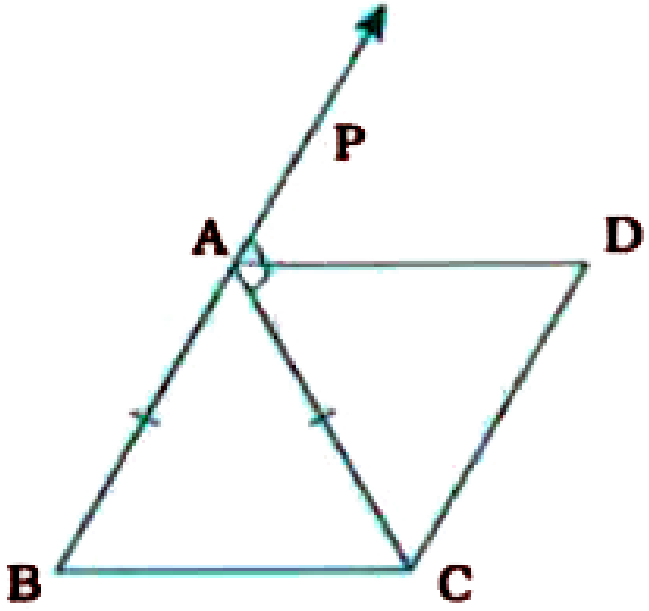
4. ABC is an isosceles triangle in which AB=AC bisects exterior angle PAC and CD||AB (See the given figure). Show that

ABCD is a parallelogram



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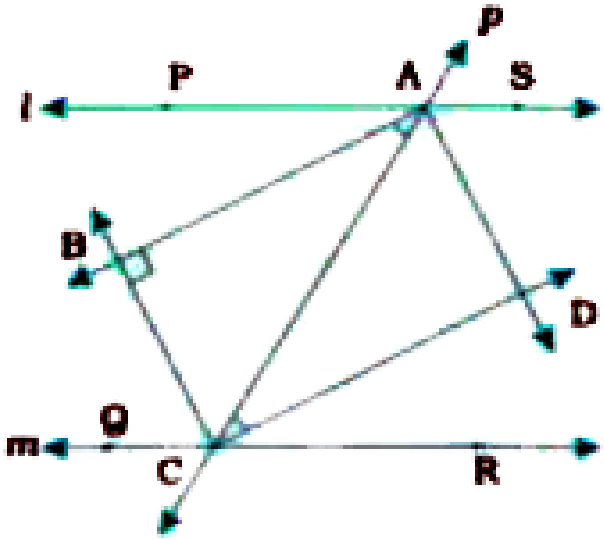
5. Two parallel lines l and m are intersected by a transversal p (see the given figure). Show that the quadrilateral formed by the bisector

of interior angles is a rectangle.



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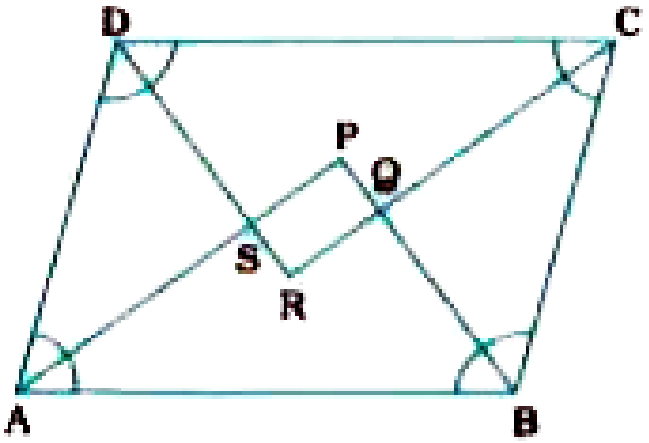
6. Show that the bisectors of angles of a parallelogram form a rectangle.



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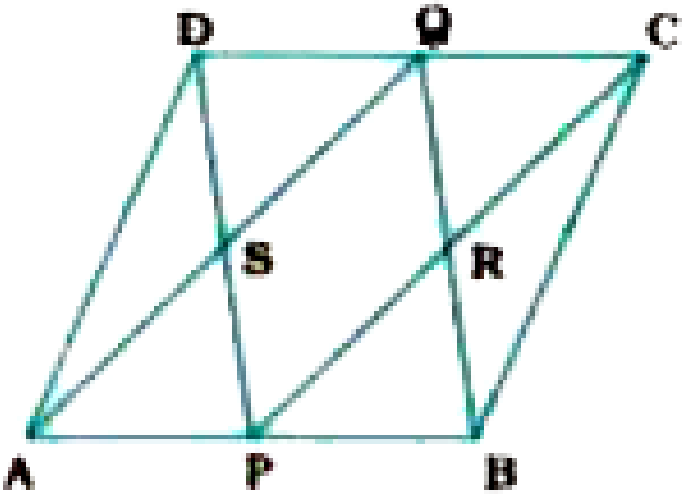
7. ABCD is a parallelogram in which P and Q are midpoints of opposite sides AB and CD (see the given figure). If AQ intersects DP at S and BQ intersects CP at R. Show that:



APCQ is a parallelogram.

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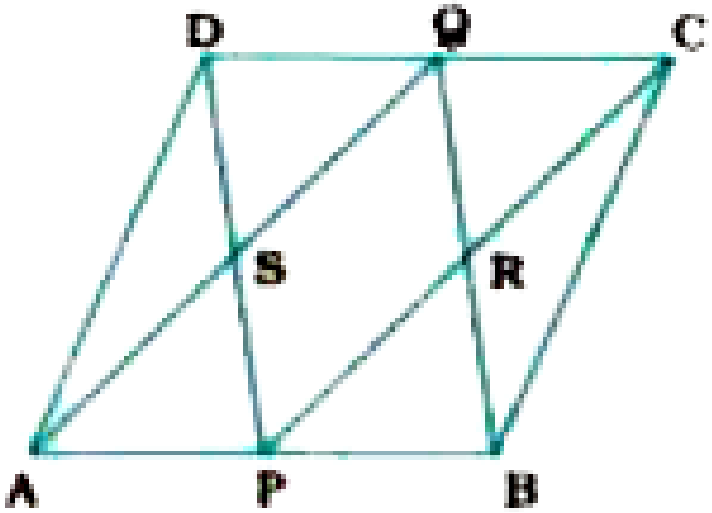
8. ABCD is a parallelogram in which P and Q are midpoints of opposite sides AB and CD (see the given figure). If AQ intersects DP at S

and BQ intersects CP at R. Show that:



DPBQ is a parallelogram.

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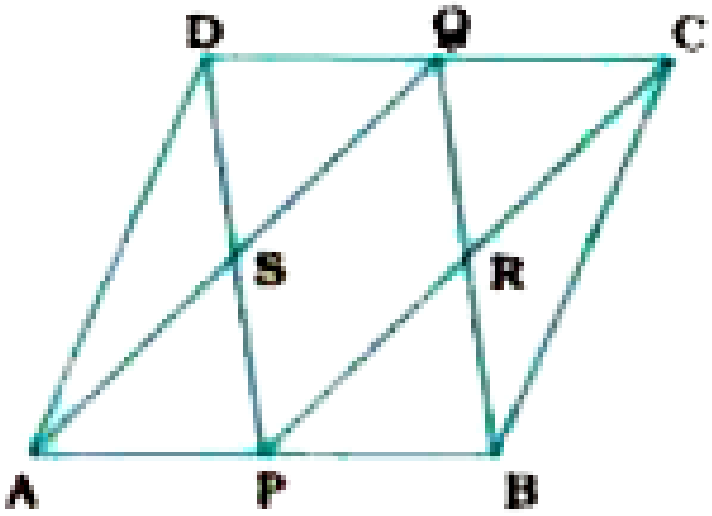
9. ABCD is a parallelogram in which P and Q are midpoints of opposite sides AB and CD

(see the given figure). If AQ intersects DP at S and BQ intersects CP at R. Show that:



DPBQ is a parallelogram.

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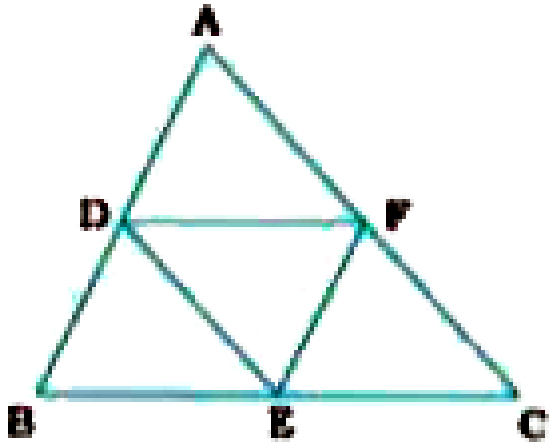
10. In ΔABC , D , E and F are respectively the midpoints of sides AB, BC and CA(see the given figure). Show that ΔABC is devided into four congruent triangles by joining D, E and F.



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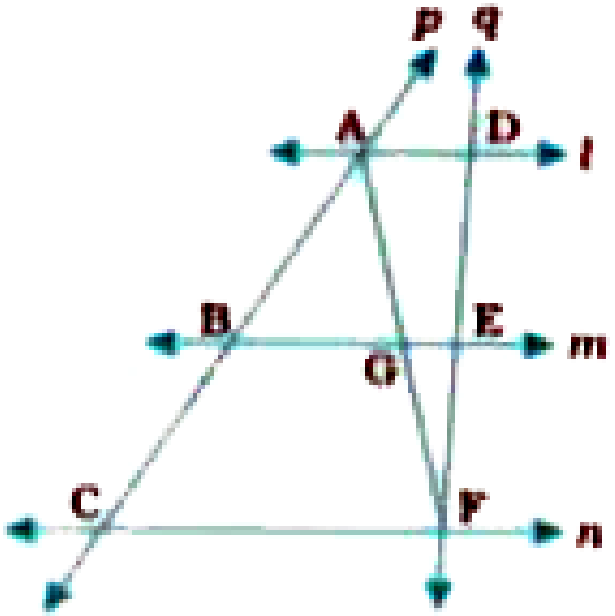
11. l, m and n are three parallel lines intersected by transversals p and q such that l , m and n cut off equal intercepts AB and BC on p (see the given figure). Show that l, m and n cut off equal intercepts DE and EF on q also.



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Exercise 8 1

1. The angles of a quadrilateral are in the ratio 3:5:9:13. Find all the angles of quadrilateral.

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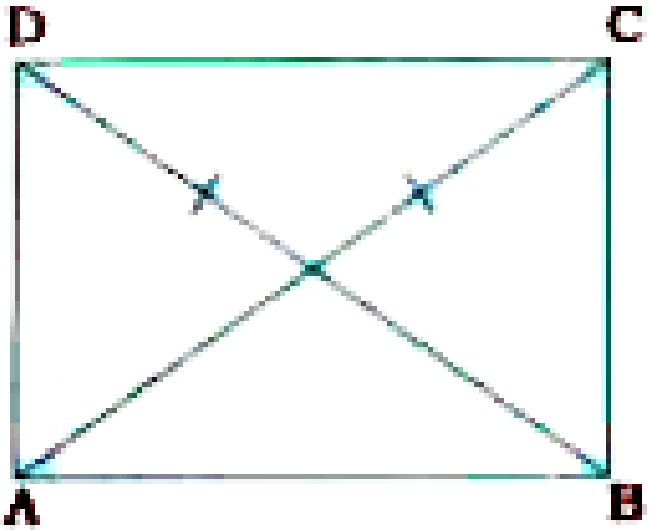
2. If the diagonals of a parallelogram are equals then show that it is a rectangle.



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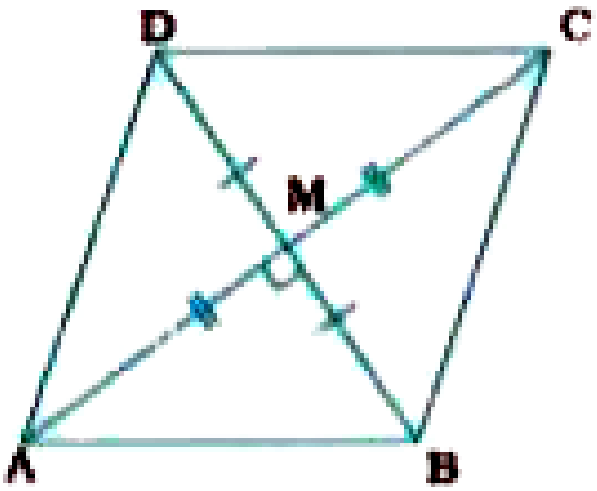
3. Show that if the diagonals of a quadrilateral bisects each other at right angles. Then it is a

rhombus.



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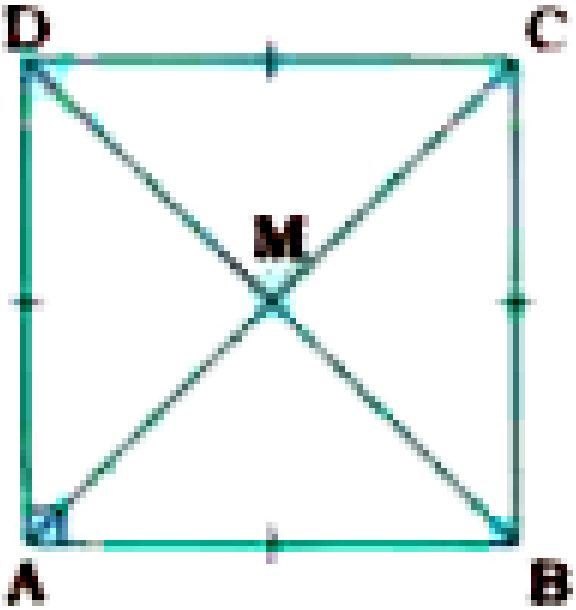
4. Show that the diagonals of a square are equal and bisect each other at right angles.



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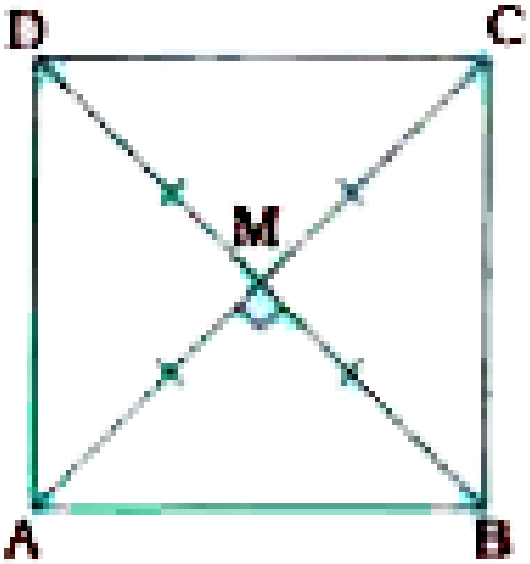
5. Show that if the diagonals of a quadrilateral are equal and bisects each other at right

angles, then it is a square.



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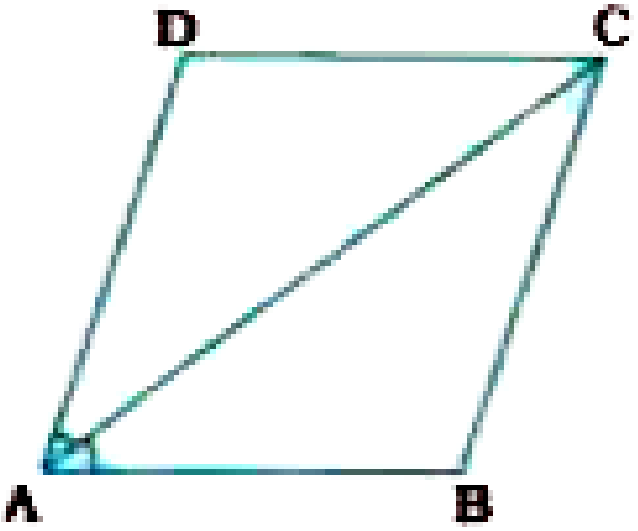
6. Diagonal AC of a parallelogram ABCD bisects

$\angle A$ (see the given figure), show that :

it bisects $\angle C$ also,



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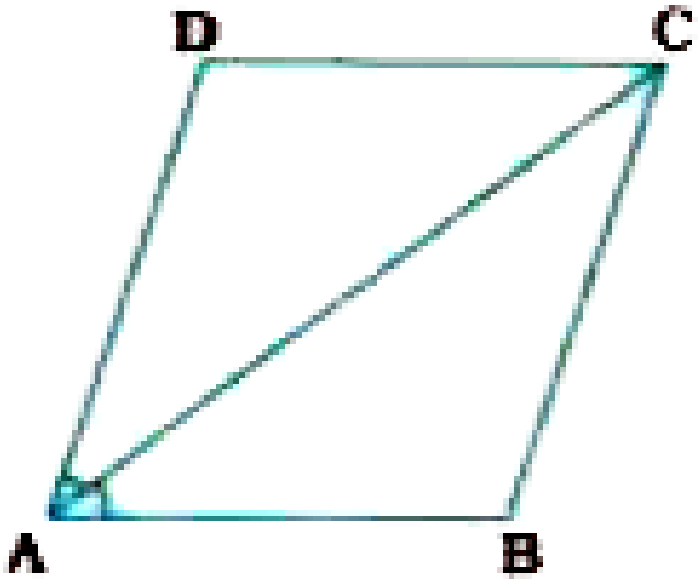
7. Diagonal AC of a parallelogram ABCD bisects

$\angle A$ (see the given figure), show that

ABCD is a rhombus.



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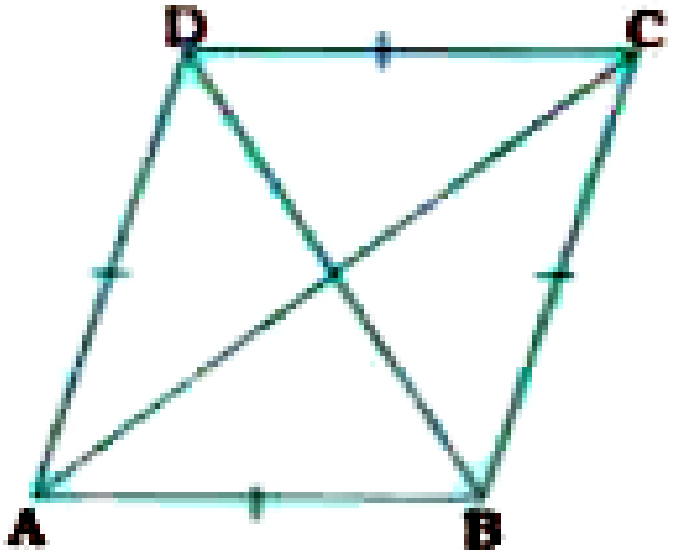
8. ABCD is a rhombus. Show that diagonal AC bisects $\angle A$ as well as $\angle C$ and diagonal BD

bisects $\angle B$ as well as $\angle D$.



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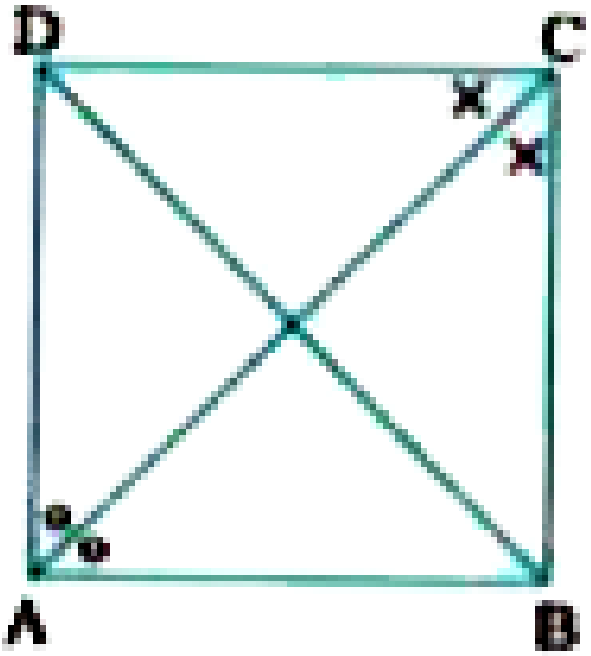
9. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that:

ABCD is a square.



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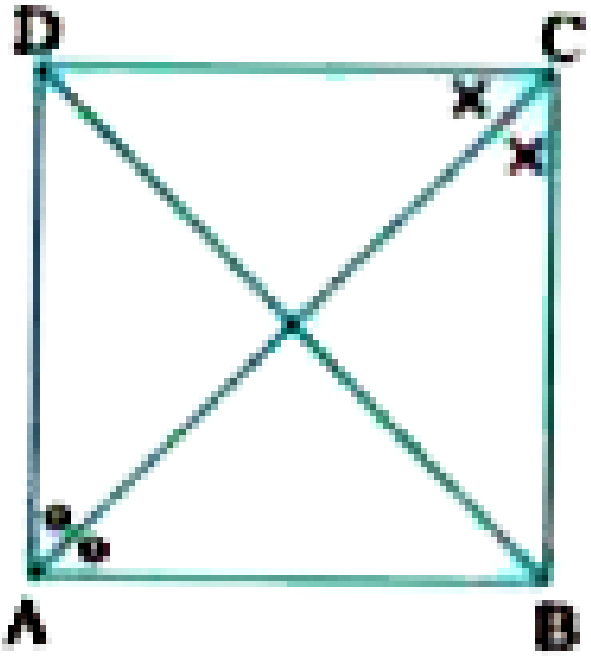

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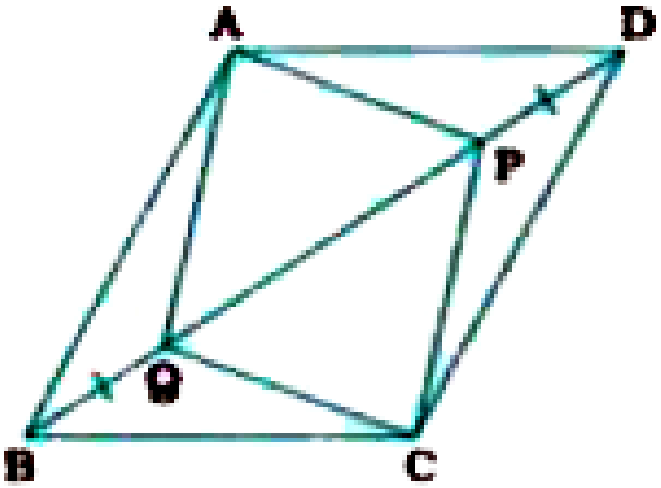
11. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP= BQ

(see the given figure) Show that:

$\Delta APD \cong \Delta CQB$



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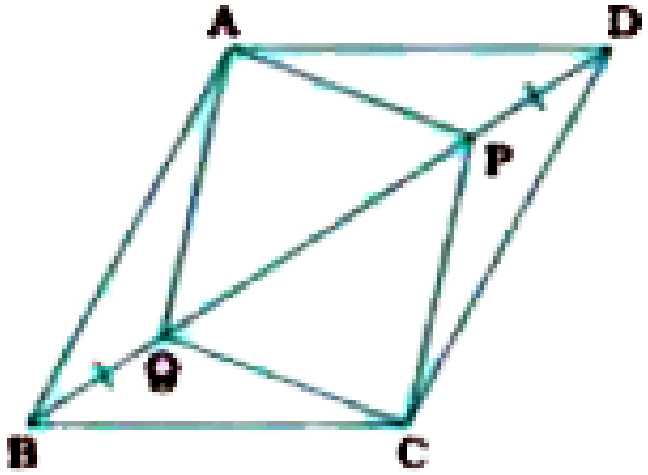
12. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP= BQ

(see the given figure) Show that:

AP= CQ



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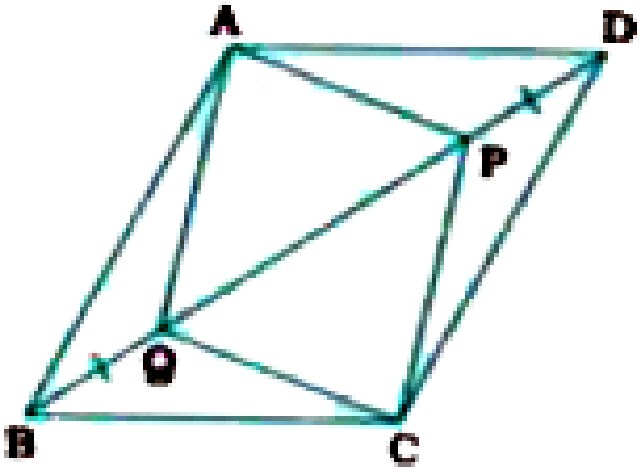
13. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP= BQ (see the given figure) Show that:

$\Delta AQB \cong \Delta CPD$



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Skill Testing Exercise

1. Prove that each diagonal of a parallelogram divides it into two congruent triangles.

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2. Prove that the bisectors of two adjacent angles of a parallelogram are perpendicular to each other.

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3. In quadrilateral ABCD, the bisectors of $\angle A$ and $\angle B$ intersect at E. Prove that, $\angle C + \angle D = 2\angle AEB$.

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4. Prove that the bisectors of two opposite angles of a parallelogram are parallel to each other.

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5. In quadrilateral ABCD, $\angle A : \angle B : \angle C : \angle D = 3 : 4 : 5 : 6$. Find all the angles of quadrilateral ABCD and state the type of quadrilateral ABCD.

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6. In quadrilateral PQRS, $\angle P : \angle Q : \angle R : \angle S = 3 : 5 : 9 : 7$. Find all the angles of quadrilateral PQRS.

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7. In parallelogram ABCD, $\angle B - \angle A = 40^\circ$.

Find all the angles of parallelogram ABCD.

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8. In ΔABC, point M on AB and point N on AC are such that $AM = \frac{1}{4}AC$ and $AN = \frac{1}{4}AC$. Prove that $MN = \frac{1}{4}BC$

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9. In ΔABC, AD is a median and E is the midpoint of AD. BE is extended to intersect AC at F. Prove that $AF = \frac{1}{3}AC$.

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10. Prove that the line segment obtained by joining the midpoints of the diagonals of a trapezium is parallel to the parallel sides of the trapezium.

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11. In trapezium ABCD, AB || CD and E is the midpoint of AD. A line drawn through E and parallel to AB intersects BC at F. Prove that F is the midpoint of BC and $EF = \frac{1}{2}(AB + CD)$.

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12. In ΔABC, D, E and F are the midpoints of AB, BC and CA respectively. If AB = 6 cm, BC = 7.2 cm and CA= 7.8, find the perimeter of ΔDEF

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13. In ΔABC, P, Q and R are the midpoints of AB, BC and CA respectively. If PQ = 5 cm, QR = 8 cm and RP = 6.5 cm, find the perimeter of ΔABC.

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14. In ΔABC, M and N are the midpoints of AB and AC respectively. If AB = 8 cm, AC = 7 cm

and MN = 4.5 cm, find the perimeter of ΔABC

.

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Multiple Choice Question Mcqs

1. The ratio of four angles in order of a quadrilateral is 2:4:5: 4. Then, the measure of the smallest angle of the quadrilateral is .....

A. 120°

B. 96°

C. 48°

D. 60°

Answer: D

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2. In quadrilateral PQRS, $\angle P = 5x, \angle Q = 3x, \angle R = 4x$ and $\angle S = 6x$. Then, the measure of the greatest angle of quadrilateral PQRS is .....

A. 100°

B. 60°

C. 80°

D. 120°

Answer: A::B

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3. In quadrilateral ABCD, $\angle A + \angle B = 150^\circ$

Then $\angle C + \angle D = \ldots\ldots$

A. 105°

B. 210°

C. 150°

D. 300°

Answer: A::B

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4. In trapezium PQRS, PQ ||RS , If $\angle P = 150^\circ$ then $\angle S =$ .....

A. 75°

B. 150°

C. 60°

D. 30°

Answer: C

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5. The perimeter of parallelogram ABCD is 22 cm, if AB= 4cm then BC= .....cm

A. 7

B. 6

C. 5

D. 4

Answer:

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6. In parallelogram ABCD, $\angle A - \angle B = 30^\circ$

Then $\angle C = \ldots\ldots\ldots$

A. 105°

B. 75°

C. 150°

D. 60°

Answer: A

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7. In parallelogram ABCD, the bisectors of $\angle A$ and $\angle B$ intersect at M. If $\angle A = 80^\circ$, then $\angle AMB = \ldots\ldots$

A. 40°

B. 50°

C. 80°

D. 90°

Answer:

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8. In parallelogram ABCD, the ratio $\angle A : \angle B : \angle C : \angle D$ can be.....

A. 3:4:5:6

B. 2:3:3:2

C. 2:3:2:3

D. 2:3:5:8

Answer: B::C

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9. In parallelogram ABCD, $3\angle A = 2\angle B$. Then, $\angle D = \ldots\ldots$

A. 120°

B. 108°

C. 72°

D. 60°

Answer: A

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10. In ΔABC, E and F are the midpoints of AB and AC respectively. If EF = 4 cm, then BC= ..... Cm

A. 8

B. 2

C. 4

D. 12

Answer:

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11. In ΔABC, P is the midpoint of AB and Q is the midpoint of AC. Then, PQCB is a .....

A. trapezium

B. parallelogram

C. rectangle

D. rhombus

Answer: A

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12. In ΔABC, D, E and F are the midpoints of AB, BC and CA respectively. If the perimeter of

ΔDEF is 30 cm, then the perimeter of ΔABC is .....

A. 15

B. 30

C. 45

D. 60

Answer:

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13. ΔABC is an equilateral triangle. D, E and F are the midpoints of AB, BC and CA respectively. If AB = 8 cm, the perimeter of A DEF is ..... cm.

A. 24

B. 12

C. 6

D. 48

Answer: A::B

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14. ABCD is a rectangle. If AB = 5 cm and BC = 12 cm. then BD= .....cm

A. 17

B. 13

C. 8.5

D. 1

Answer: A::C

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15. ABCD is a rhombus. If AC= 10 cm and BC= 24 cm the perimeter of ABCD is ..... Cm.

A. 13

B. 26

C. 52

D. 48

Answer: B

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