FREE NCERT SOLUTIONS

CLASS - 9

QUADRILATERALS

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EXERCISE 8.1 - Question No. 1

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

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EXERCISE 8.1 - Question No. 2

If the diagonals of a parallelogram are equal, then show that it is a rectangle

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EXERCISE 8.1 - Question No. 3

Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus

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EXERCISE 8.1 - Question No. 4

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

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EXERCISE 8.1 - Question No. 5

Show that if the diagonals of a quadrilateral are equal and bisect each other at right angles, then it is a square

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EXERCISE 8.1 - Question No. 6

Diagonal AC of a parallelogram ABCD bisects $\angle A$. Show that (i) it bisects $\angle C$ also, (ii) ABCD is a rhombus.

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EXERCISE 8.1 - Question No. 7

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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EXERCISE 8.1 - Question No. 8

ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that: (i) ABCD is a square (ii) diagonal BD bisects $\angle B$ as well as $\angle D$.

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EXERCISE 8.1 - Question No. 9

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$. Show that: (i) $\Delta APD \cong \Delta CQB$ (ii) $AP = CQ$ (iii) ΔABC (iv) $AQ = CP$ (v) APCQ is a parallelogram

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EXERCISE 8.1 - Question No. 10

ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD . Show that (i) $\Delta APB \cong \Delta CQD$ (ii) $AP = CQ$

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EXERCISE 8.1 - Question No. 11

In ΔABC and ΔDEF, $AB = DE$, $AB \parallel DE$, $BC = EF$ and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (see Fig. 8.22). Show that (i) quadrilateral ABED is a parall

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EXERCISE 8.1 - Question No. 12

ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$. Show that (i)$\angle A = \angle B$ (ii) $\angle C = \angle D$ (iii) $\Delta ABC \cong \Delta BAD$ (iv) $diagonal AC = diagonal BD$

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EXERCISE 8.2 - Question No. 1

ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA. AC is a diagonal. Show that : (i) $SR \mid\mid AC$ and $SR = \frac{1}{2}AC$ (ii) $PQ = SR$ (iii) PQRS is a parallelogram

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EXERCISE 8.2 - Question No. 2

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.

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EXERCISE 8.2 - Question No. 3

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

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EXERCISE 8.2 - Question No. 4

ABCD is a trapezium in which $AB \parallel DC$, BD is a diagonal and E is the mid-point of AD. A line is drawn through E parallel to AB

intersecting BC at F (see Fig. 8.30). Show that F is the mid-point of BC.

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EXERCISE 8.2 - Question No. 5

In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD.

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EXERCISE 8.2 - Question No. 6

Show that the line segments joining the mid-points of the opposite sides of a quadrilateral bisect each other

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EXERCISE 8.2 - Question No. 7

ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that (i) D is the mid-point of AC (ii) $MD \perp AC$ (iii) $CM = MA = \frac{1}{2}AB$

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SOLVED EXAMPLES - Question No. 1

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

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SOLVED EXAMPLES - Question No. 2

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

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SOLVED EXAMPLES - Question No. 3

ABC is an isosceles triangle in which $AB = AC$. AD bisects exterior angle PAC and $CD \parallel AB$. Show that (i) $\angle DAC = \angle BCA$

and (ii) ABCD is a parallelogram.

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SOLVED EXAMPLES - Question No. 4

Two parallel lines l and m are intersected by a transversal p (see Fig. 8.15). Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.

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SOLVED EXAMPLES - Question No. 5

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

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SOLVED EXAMPLES - Question No. 6

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. (iii) PSQR is a parallelogram

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SOLVED EXAMPLES - Question No. 8

In ΔABC , D, E and F are respectively the mid-points of sides AB, BC and CA. Show that ΔABC is divided into four congruent

triangles by joining D, E and F.

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SOLVED EXAMPLES - Question No. 9

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 Fig. 8.28). Show that l, m and n cut off equal intercepts DE and EF on q also

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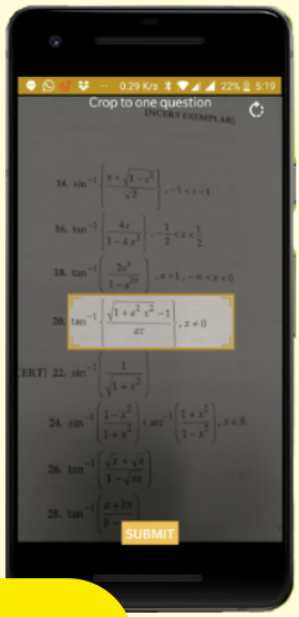

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