MATHS

BOOKS - CALCUTTA BOOK HOUSE MATHS (BENGALI ENGLISH)

PROPERTIES OF PARALLELOGRAM

Examples Mcq

1. If $\angle BAD = 75^\circ$ and $\angle CBD = 60^\circ$ in the parallelogram ABCD , then the measurement of $\angle BDC$ is -

A. 60°

B. 75°

C. 45°

D. 50°

Answer: C

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2. In which one of the following geometric figures, the length of two diagonals are equal ?

A. Parallelogram

B. Rhombus

C. Trapezium

D. Rectangle

Answer: D

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3. In the parallelogram ABCD , M is the mid-point of the diagonal BD, BM bisects equally $\angle ABC$ then the measurement of $\angle AMB$ =

A. 45°

B. 60°

C. 90°

D. 75°

Answer: C

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4. If $\angle ACB = 40^\circ$ in rhombus ABCD , then $\angle ADB$ =

A. 50°

B. 110°

C. 90°

D. 120°

Answer: A

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Examples Short Answer Type Questions

1. If in the parallelogram ABCD $\angle A : \angle B = 3 : 2$, then find the angles of the parallelogram ABCD.

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2. The bisectors of $\angle A$ and $\angle B$ meet at a point E on the side CD of the parallelogram ABCD . If the length of the side BC be 2 cm , find the length of the side AB.

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3. If the equilateral triangle ΔAOB be into the square ABCD. Find $\angle COD$

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4. M is a point on the side AD of the square ABCD such that $\angle CMD = 30^\circ$. If the diagonal BD intersects CM at a point P , then find $\angle DPC$.

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5. The length of AB of the rhombus ABCD is 4 cm and if $\angle BCD = 60^\circ$ then find the length of the diagonal BD.

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6. In the parallelogram ABCD , AP and DP are the bisectors of the $\angle BAD$ and $\angle ADC$ respectively. Find the $\angle APD$

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Examples

1. Prove that if the lengths of the two diagonals of a parallelogram be equal , then the parallelogram is a rectangle.

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2. Prove that if the lengths of two diagonals of any parallelogram be equal and if the diagonals intersect each other orthogonally, then the parallelogram is a square.

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3. Prove that if the two diagonals of any parallelogram intersect each other orthogonally, then the parallelogram is a rhombus.

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4. The diagonals AC and BD of the parallelogram ABCD intersect each other at O . Any straight line passing through O intesects the sides AB and CD at the points P and Q respectively . Prove that OP = OQ.

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5. Prove that two angles attached to the parallel sides of any isosceles trapezium are equal to each other .

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6. P is any point on BC of the square ABCD. The perpendicular , drawn from B to AP intersects DC at Q . Prove that AP = BQ.

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7. Verify whether the following are zeroes of the polynomial, indicated against them $p(x) = 3x + 1$ at $x = -\frac{1}{3}$

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8. AC is a common diagonal to both the parallelograms ABCD and AECF. If the points B , E , D , F are not collinear , prove that BEDF is a parallelogram.

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9. Find the area and perimeter of an isosceles right triangle whose hypotenuse side is 12 cm.

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10. In the parallelogram ABCD , AB = 2AD . Prove that the bisectors of the angles $\angle BAD$ and $\angle ABC$ meet at the mid-point of DC at right -angles.

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Exercise 1 Mcq

1. The diagonals of which one of the following geometric figures bisects each orthogonally ?

A. Rectangle

B. Rhombus

C. Parallelogram

D. Trapezium

Answer: B

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2. In the parallelogram ABCD , $\angle BAD = 100^\circ$ and $\angle CBD = 45^\circ$, then $\angle BDC =$

A. 35°

B. 45°

C. 60°

D. 75°

Answer: A

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3. The bisectors of $\angle A$ of the parallelogram ABCD intersect DC at P , If $\angle PDA = 110^\circ, \quad \text{then} \angle APD$ =

A. 10°

B. 20°

C. 30°

D. 35°

Answer: D

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4. If the difference between $\angle A$ and $\angle B(\angle A > \angle B)$ of the parallelogram ABCD be 20°, then$\angle A$

A. 90°

B. 100°

C. 105°

D. 110°

Answer: B

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5. If $\angle A : \angle B = 3:1$ in the parallelogram ABCD , then $\angle A$=

A. 45°

B. 90°

C. 135°

D. 145°

Answer: C

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6. If the lengths of the diagonals of the rhombus ABCD be 6 cm and 8 cm respectively , then the perimeter of the rhombus is equal to -

A. 5 cm

B. 10 cm

C. 15 cm

D. 20 cm

Answer: D

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7. The other angles of the parallelogram ABCD, if one of its angles is 60° , are

A. $100^\circ, 60^\circ, 140^\circ$

B. $120^\circ, 60^\circ, 120^\circ$

C. $80^\circ, 60^\circ, 160^\circ$

D. $110^\circ, 60^\circ, 130^\circ$

Answer: B

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8. The perimeter of a parallelogram is 50cm , If the length of its greater side be 15 cm , then the length of its smaller side is equal to -

A. 8 cm

B. 9 cm

C. 10 cm

D. 11 cm

Answer: C

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9. If in the parallelogram ABCD , AB = (2x+4) cm , DC = (4x-12) cm and the length of each of the two other sides of it be (2x-5)cm , then (2x-5) =

A. 10

B. 11

C. 12

D. 8

Answer: B

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10. Any angle of a quadrilateral is not a right -angle and its diagonals bisect each other . Then the quadrilateral is a -

A. Rhombus

B. Rectangle

C. Trapezium

D. Parallelogram

Answer: D

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Exercise 1 Short Answer Type Questions

1. Find the angles of the parallelogram ABCD , if $\angle C : \angle D = 4 : 5$

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2. What is the length of the other diagonal of a rhombus , if one its diagonal is 12 cm and the sides of it is 10 cm.

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3. The length of the side AB of the rhombus ABCD is 4 cm and $\angle BCD = 60^\circ$ then find the length of AC.

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4. One of the two adjacent angles of a parallelogram is 18° more than the double of the other . Find the greatest angle of the parallelogram.

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5. In the parallelogram ABCD , $\angle B - \angle C = 60^\circ$. Find$\angle A$ and $\angle D$

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6. The length of the side PQ of the rhombus PQRS is 6 cm and $\angle PQR = 120^\circ$. Find the length of the diagonal QS.

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7. In the rhombus ABCD , if $\angle ABC = 36^\circ$, then find $\angle ACD$.

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8. The bisectors of $\angle A$ and $\angle B$ of the parallelogram ABCD meet at the point P on the side CD. If the length of the side AB be 4 cm , find the length BC.

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9. The equilateral triangle COD lie into the square ABCD , Find $\angle AOB$.

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10. M is such a point on AD of the square ABCD that $\angle CMD = 60^\circ$. The diagonal BD intersect CM at the point P , then find $\angle DPC$.

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Exercise 1 Long Answer Type Questions

1. Prove that if one of the angles of a parallelogram be a right -angle , then it should be a rectangle.

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2. Prove that if two opposite angles and two opposite sides of any quadrilateral be parallel , then it is a parallelogram.

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3. Prove that if the diagonals of any parallelogram intersect each other orthogonally, then it is a

rhombus.

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4. The diagonal SQ of the parallelogram PQRS is divided into three equal parts at K and L . PK intersect SR at M and RL intersect PQ at N . Prove that PMRN is a parallelogram.

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5. Prove that the quadrilateral obtained by successively joining the mid -points of a

parallelogram is also a parallelogram.

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6. Find the area of a triangle two sides of which are 18 cm and 10 cm and the perimeter is 42 cm.

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7. E and F are the mid - points of AB and AC respectively of ΔABC . The st. line EF is extended to the point D such that EF = FD. Prove that ADCE is a parallelogram.

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8. The diagonals of the square ABCD intersect each other at O .Let $OP \perp AB$ is constructed. Prove that $\angle AOP = \angle PBO$

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9. In the quadrilateral ABCD , AD = BC and $\angle BAD = \angle ABC$. Prove that the quadrilateral is an isosceles trapezium.

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10. If S be the sample space and E be the event then P(E)=

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11. Find the value of the polynomial $5x - 4x^2 + 3$ at x = 0 is

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12. The points E, F , G and H are on the sides AB, BC , CD and DA respectively of the rectangle ABCD , such

that AE = BF = CG = DH . Prove that EFGH is a parallelogram.

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13. Determine whether the given value of x is a zero of the given polynomial or not $x^2 + 6x + 5$ at x = -1 and x= -5

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14. Determine whether the given value of x is a zero of the given polynomial or not $x^2 + x + 1$ at x = -1

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