



## MATHS

# NCERT - NCERT MATHS (KANNADA ENGLISH)

## QUADRILATERALS

**Illustrative Examples** 

**1.** ABCD is a parallelogram and  $\angle A = 60^{\circ}.$ 

Find the remaining angles.



3. Two adjacent sides of a parallelogram are

4.5 cm and 3 cm. Find its perimeter.

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

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6. 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.

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7. In  $\Delta ABC$ , D, E and F are the midpoints of sides AB, BC and CA respectively. Show that  $\Delta ABC$  is divided into four congruent triangles, when the three midpoints are joined

to each other. ( $\Delta DEF$  is called medial triangle)



**8.** I, 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.



9. In the Fig. AD and BE are medians of  $\Delta ABC$  and BE||DF. Prove that CF = (1)(4)AC.

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**10.** ABC is a triangle and through A, B, C lines are drawn parallel to BC, CA and ABrespectively intersecting at P, Q and R. Prove that the perimeter of  $\Delta PQR$  is double the perimeter of  $\Delta ABC$ .



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

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2. Show that the diagonals of a rhombus

divide it into four congruent triangles.

### **Try This**



 $\angle ABC$  and  $\angle CBE$ ?



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 ()

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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 ( )

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**6.** State whether the statements are True or False.

(vi) All parallelograms are rectangles

**7.** Complete the following table by writing (YES) if the property holds for the particular Quadrilateral and (NO) if property does not holds.

Properties	Trapezium	Parallelogram	Rhombus	Rectangle	square
a. Only one pair of opposite sides are parallel	YES				
b. Two pairs of opposite sides are parallel		$\sim$			
c. Opposite sides are equal					
d. Opposite angles are equal	$\frown$				
e. Consecutive angles are supplementary					
f Diagonals bisect each other					
g. Diagonals are equal					
h. All sides are equal				i E	
i Each angle is a right angle					
j. Diagonals are per- pendicular to each other.					

8. ABCD is a trapezium in which  $AB \mid CD \text{ and } AD = BC$  Show that A = B $\angle C = \angle D$  $\Delta ABC \approx \Delta BAD$ diagonal AC=diagonal BD Watch Video Solution

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



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#### 10. ABCD is a rectangle AC is diagonal. Find the

#### nature of $\Delta ACD$ . Give reasons.

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Exercise 8 2

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





2. If a quadrilateral ABCD, the bisector of  $\angle C \angle D$  intersect at O. Prove that  $\angle COD = \frac{1}{2}(\angle A + \angle B)$ Watch Video Solution

#### Exercise 8 3

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

Find the measure of each angle of the

parallelogram.



2. Find the measure of all the angles of a parallelogram, if one angle is  $24^{\circ}$  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. 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).



**8.** 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.

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**1.** ABC is a triangle . D is a point of AB such that  $AD = rac{1}{4}AB$  and E is a point on AC

such that 
$$AE = rac{1}{4}AC$$
. If  $DE = 2cm$  find BC.

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**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.

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



**4.** In a parallelogram ABCD, E and F are the mid points of sides AB and CD respectively (see fig.) Show that the line segements AF and EC trisect the diagonal BD.



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



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

D is the mid point of AC

 $MD \perp AC$ 

$$CM = MA = rac{1}{2}AB$$