

**NISCORT FATHER AGNEL SCHOOL, VAISHALI**

**MATHEMATICS WORKSHEET**

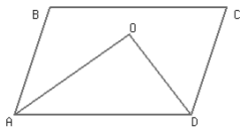
**CLASS IX**

**TOPIC: QUADRILATERALS**

(1) The diagonals of a rhombus ABCD intersect at O. If AB = 15 cm, diagonal BD = 24 cm, find the length of other diagonal AC.

(2) In a square ABCD, E, F, G and H are the mid points of the four sides, what kind of shape is represented by EFGH.

(3) In the parallelogram ABCD, the sum of angle bisectors of two adjacent angles is \_\_\_\_\_.



(4) ABCD is a parallelogram. The angle bisectors of  $\angle A$  and  $\angle D$  meet at O. What is the measure of  $\angle AOD$ ?

(5) In a parallelogram ABCD, find  $\angle CDB$  if  $\angle DAB = 51^\circ$  and  $\angle DBC = 45^\circ$ .

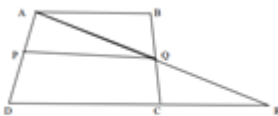
(6) In a quadrilateral ABCD, the angles A, B, C and D are in ratio 3:4:5:6. Find the measure of each angle of the quadrilateral.

(7) ABCD is a parallelogram. L and M are points on AB and DC respectively such that AL = CM. The diagonal BD intersects LM at point O. If AB = 14 cm, AD = 9 cm and LO = 5 cm, find the length of MO.

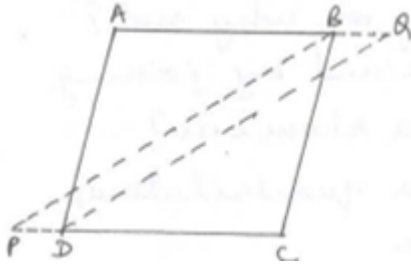
(8) In a rhombus, one of the diagonals is equal to a side of the rhombus. Find the angles of the rhombus.

(9) ABCD is a parallelogram and P and R are the midpoints of side DC and BC respectively. If line PR intersect diagonal AC at Q, prove that  $AC = 4CQ$ .

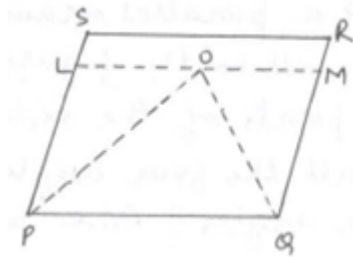
(10) In fig, P, Q are midpoints of the non-parallel sides AD and BC of a trapezium ABCD. Show that  $PQ = \frac{1}{2}(AB + DC)$ . (Hint: join AQ and produce it to meet DC produced at R)



(11) Bisectors of  $\angle B$  and  $\angle D$  of quadrilateral ABCD meet CD and AB produced at P and Q respectively. Prove that  $\angle P + \angle Q = \frac{1}{2}(\angle ABC + \angle ADC)$



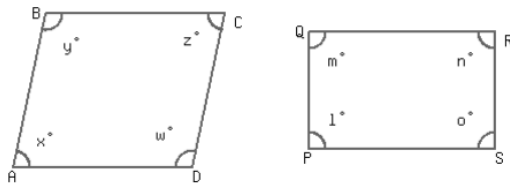
(12) PQRS is a parallelogram, PO and QO are respectively the angle bisectors of  $\angle P$  and  $\angle Q$ . Line LOM is drawn parallel to PQ. Prove that (i)  $PL = QM$  (ii)  $LO = OM$



(13) P, Q, R are respectively the mid points of the side BC, CA, AB of  $\triangle ABC$ . PR and BQ meet at X. CR and BQ meet at Y. Prove that  $XY = \frac{1}{4} BC$ .

**Choose correct answer(s) from the given choices**

(14) ABCD and PQRS are parallelograms as shown in the figure below:

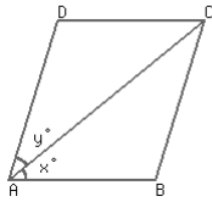


- a.  $x + y = l + m$
- b.  $x + w = l + m$
- c.  $x + y = l + o$
- d. all of above

(15) The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rhombus if

- a. Diagonals of PQRS are equal
- b. PQRS is a parallelogram
- c. Diagonals of PQRS are perpendicular
- d. Cannot be determined

(16) In parallelogram ABCD, CD is smaller than BC as shown below:



- a.  $y > x$
- b.  $x = y$
- c.  $y < x$
- d. Cannot be determined from the given data

(17) ABCD is a quadrilateral and  $\angle A = \angle B = \angle C = \angle D = 90^\circ$ . Then ABCD can be called as

- a. Parallelogram
- b. Square
- c. Rectangle
- d. Both rectangle and parallelogram

(18) Prove that each angle of a rectangle is a right angle.

(19) D, E and F are the mid points of the sides AB, BC and AC of  $\triangle ABC$ . Prove that BEFD is a parallelogram.

(20) ABCD is a trapezium in which  $AB \parallel CD$  and  $AB = CD$ . Prove that  $\angle A = \angle B$

**NISCORT FATHER AGNEL SCHOOL, VAISHALI**

**MATHEMATICS WORKSHEET**

**CLASS IX**

**TOPIC: TRIANGLES**

Q.1 Which of the following is not a criterion for congruence of triangles?

- (a) SAS      (b) ASA      (c) SSA      (d) SSS

Q.2 The angles of a triangle are in the ratio 5:3:7 . The triangle is

- (a) an acute angled triangle      (b) an obtuse angled triangle  
(c) an equilateral triangle      (d) a right triangle.

Q.3 In triangles ABC and PQR,  $AB = AC$  and  $CP = B$  . The two triangles are

- (a) Isosceles but not congruent      (b) isosceles and congruent  
(c) congruent but not isosceles      (d) neither congruent nor isosceles.

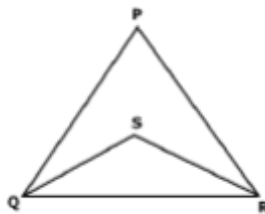
Q.4 In a right angled triangle , one acute angle is double the other. Then,

- (a) Hypotenuse=double the smallest side      (b) Hypotenuse=triple the smallest side  
(c) One acute angle is  $48^\circ$       (d) is an isosceles.

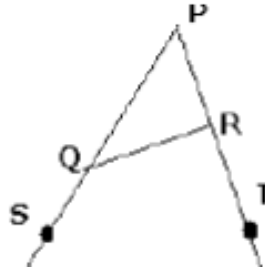
Q.5 ABC is an isosceles triangle with  $AB = AC$ . Draw  $AP \perp BC$  . Then

- (a)  $\angle B = \angle C$       (b)  $\angle B + \angle C = 90^\circ$       (c)  $AP = BP$       (d)  $BP \neq PC$

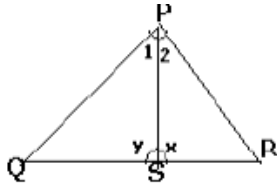
Q.6 In the given figure  $PQ > PR$  and QS and RS are the bisectors of  $\angle Q$  and  $\angle R$  respectively. Show that  $SQ > SR$ .



Q.7 In the given figure, sides PQ and PR are produced and  $\angle SQR < \angle TRQ$ . Prove that  $PR > PQ$ .



Q.8 In the given figure,  $PR > PQ$  and  $PS$  is the bisector of  $\angle QPR$ . Show that  $x > y$

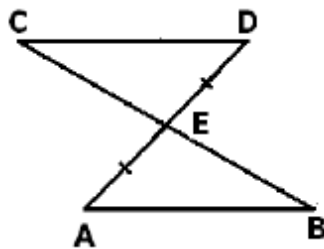


Q.9 Bisectors of the angles B and C of an isosceles triangle ABC with  $AB = AC$  intersect each other at O. Show that external angle adjacent to  $\angle ABC$  is equal to  $\angle BOC$ .

Q.10 If the bisector of an angle of a triangle also bisects the opposite side, prove that the triangle is isosceles.

### QUESTIONS BASED ON INEQUALITY

- In  $\triangle ABC$ ,  $AB = 4\text{cm}$  and  $BC = 5\text{cm}$ . Find the greatest angle.
- In  $\triangle ABC$ , if  $AD$  is the bisector of  $BC$ .
- $O$  is a point in the interior of  $\triangle ABC$ , prove  $AB + AC > OB + OC$
- $AD$  is a median to side  $BC$  of  $\triangle ABC$ . Prove that  $AB + AC > 2AD$ .
- Show that the difference between any two sides of a triangle is less than the third side.
- Line-segment  $AB$  is parallel to another line-segment  $CD$ .  $E$  is the mid-point of  $AD$ . Show that



(i)  $\triangle AEB \cong \triangle DEC$

(ii)  $E$  is also the mid-point of  $BC$ .