

Class : 9 th First Semester Examination		IX
Time : 2 Hrs.	Subject : Mathematics - II (Geometry)	Total Marks : 40
S.No. <input type="text"/>		Medium : English

- Note :
- 1) All questions are compulsory.
 - 2) Use of calculator is not allowed.
 - 3) The numbers to the right of the questions indicate full marks.
 - 4) In case of MCQ's (Q. No. 1. A) only the first attempt will be evaluated and will be given credit.
 - 5) For every MCQ, the correct alternative (A, B, C and D) with subquestion number is to be written as an answer.
 - 6) The mark of construction should be clear. Do not erase them.
 - 7) Draw proper figures for answers wherever necessary.

Q. 1. A) Select the correct alternative in the following statements and write their alphabet. (04)

i) In ΔTPQ , $\angle T = 65^\circ$, $\angle P = 95^\circ$, which of the following is a true statement ?

A) $PQ < TP$ B) $PQ < TQ$
 C) $TQ < TP < PQ$ D) $PQ < TP < TQ$

ii) A transversal intersects two parallel lines. If the measure of one of the angle is 40° then the measure of its corresponding angle is

A) 40° B) 140° C) 50° D) 180°

iii) If P-Q-R and $d(P, Q) = 2$, $d(P, R) = 10$ then find $d(Q, R)$.

A) 12 B) 8 C) $\sqrt{96}$ D) 20

iv) How many lines are determined by three distinct points ?

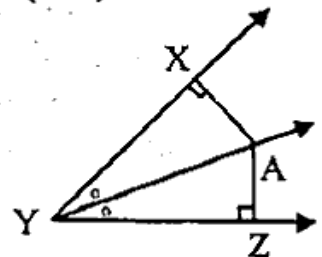
A) Two B) Three C) One of Three D) Six

B) Solve the following questions. (04)

i) Point P is the midpoint of seg CD. If $CP = 2.5$, find $l(CD)$.

ii) In figure point A is on the bisector of $\angle XYZ$.

If $AX = 2$ cm then find AZ.



iii) In ΔPQR , $\angle P = 70^\circ$, $\angle Q = 65^\circ$ then find $\angle R$.

iv) In ΔLMN , $LM = 10$ cm, $MN = 12$ cm, $LN = 8$ cm. Find out the greatest angle of the triangle.

Q. 2. A) Complete the following activity. (Any two) (04)

i) Complete the proof of the theorem.

Theorem : If measures of angles of a triangle are $45^\circ, 45^\circ, 90^\circ$ then the length of each side containing the right angle is $\frac{1}{\sqrt{2}} \times$ hypotenuse.

Proof : In $\triangle ABC$, $\angle B = 90^\circ$ and

$$\angle A = \angle C = 45^\circ \quad \therefore BC = AB$$

By pythagorus Theorem

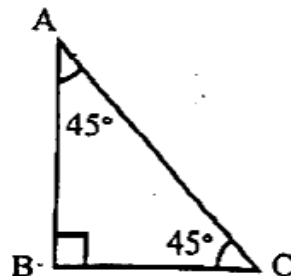
$$AB^2 + BC^2 = \boxed{}$$

$$AB^2 + \boxed{} = AC^2 \quad \dots (\because BC = AB)$$

$$\therefore 2AB^2 = \boxed{}$$

$$\therefore AB^2 = \boxed{}$$

$$\therefore AB = \frac{1}{\sqrt{2}} \times AC$$



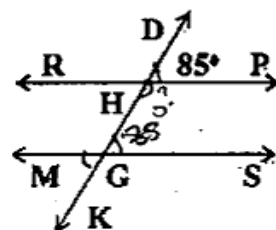
ii) Complete the following activity from figure.

In figure line $RP \parallel$ line MS and line DK is their transversal.

$\angle DHP = 85^\circ$ then

a) $\angle RHD = \boxed{95^\circ}$ b) $\angle PHG = \boxed{95^\circ}$

c) $\angle HGS = \boxed{85^\circ}$ d) $\angle MGK = \boxed{}$



iii) Complete the following activity.

Theorem: The opposite angles formed by two intersecting lines are of equal measures.

Proof : $\angle AOC + \boxed{} = 180^\circ$

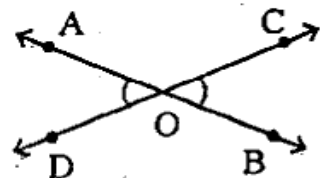
..... (I) (Angles in linear pair)

$$\angle BOC + \angle BOD = \boxed{} \quad \dots (II) \text{ (Angles in linear pairs)}$$

$$\therefore \angle AOC + \angle BOC = \angle BOC + \boxed{} \dots \text{ (from I and II)}$$

$$\therefore \angle AOC = \boxed{} \quad \text{(eliminating } \angle BOC)$$

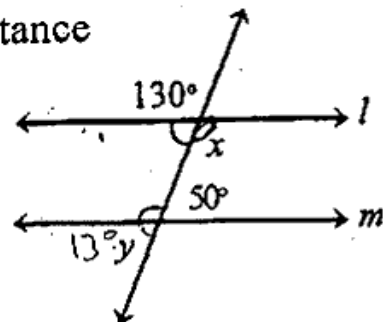
Similarly, it can be proved that $\angle BOC = \angle AOD$.



B) Solve the following questions. (Any four) (08)

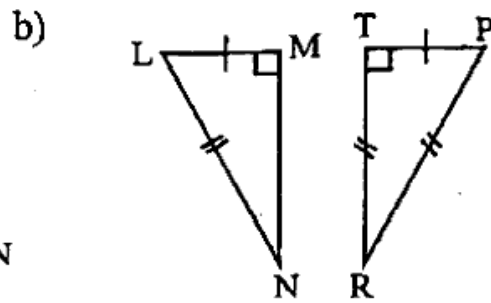
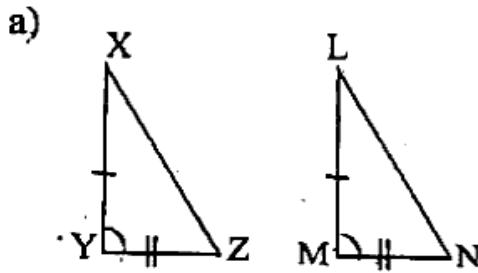
i) Co-ordinate of point P on a number line is -7. Find the co-ordinates of points on the number line which are at a distance of 8 units from point P.

ii) In figure, measures of some angles are shown. Using the measures. Find the measure of $\angle x$ and $\angle y$.



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iii) In adjoint pairs of figures, write the test of congruence by which they are congruent.



iv) Draw seg AB = 5.1 cm and draw its perpendicular bisector.

v) In $\triangle XYZ$, $XY = 4$ cm, $YZ = 6$ cm, $XZ = 5$ cm. If $\triangle XYZ \sim \triangle PQR$ and $PQ = 8$ cm find QR.

Q. 3. A) Complete the following activity. (Any one) (03)

i) Theorem : Every point on the perpendicular bisector of a segment is equidistant from the end points of the segment.

Given : Line l is perpendicular bisector of seg AB at point M. Point P is any point on line l .

To prove : $PA = PB$

Construction : Draw seg AP and seg BP.

Proof : In $\triangle PMA$ and $\triangle PMB$.

seg PM \cong (Common side)

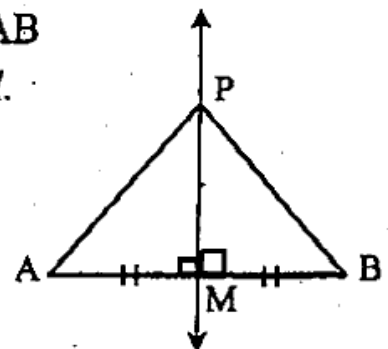
$\angle PMA \cong \angle PMB$ ()

seg AM \cong (given)

$\therefore \triangle PMA \cong \triangle PMB$ ()

seg PA \cong seg (c.s.c.t.)

$\therefore PA =$



ii) Complete the activity from figure.

In figure if $\angle a \cong \angle b$ and

$\angle x \cong \angle y$ then prove that line $l \parallel$ line n .

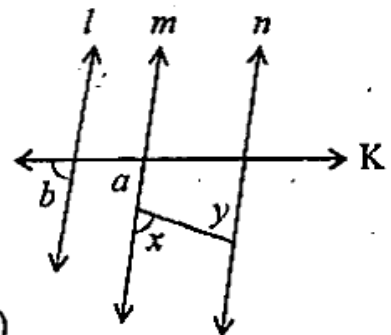
Solution : $\angle a \cong \angle b$ (given)

\therefore \parallel (I)
(Corresponding angle test)

$\angle x \cong \angle y$ (given)

\therefore \parallel (II) (Alternating angle test)

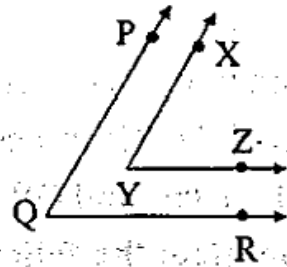
\therefore \parallel (from I and II)



B) Solve the following questions. (Any two) (06)

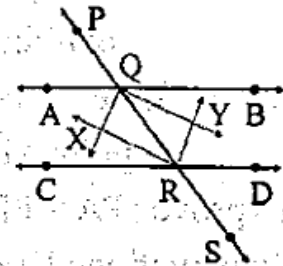
- i) Construct ΔPQR , in which $QR = 4.2$ cm, $m\angle Q = 40^\circ$ and $PQ + PR = 8.5$ cm.
- ii) The measure of angles of triangle are x° , $(x - 20)^\circ$, $(x - 40)^\circ$, find the measure of each angle.
- iii) On a number line, points A, B and C are such that $d(A, C) = 10$, $d(C, B) = 8$. Find $d(A, B)$ considering all possibilities.

- iv) In figure sides of $\angle PQR$ and $\angle XYZ$ are parallel to each other prove that $\angle PQR \cong \angle XYZ$.



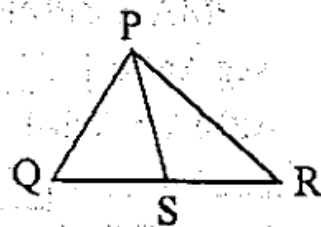
Q. 4. Solve the following questions. (Any two) (08)

- i) In figure line PS is a transversal of parallel line AB and line CD. If ray QX, ray QY, ray RX, and ray RY are angle bisectors then prove that $\square QXRY$ is a rectangle.



- ii) Construct ΔXYZ in which $\angle y = 58^\circ$, $\angle x = 46^\circ$ and the perimeter of triangle is 10.5 cm.

- iii) In figure, point S is any point on side QR of ΔPQR . Prove that $PQ + QR + RP > 2PS$.



Q. 5. Solve any one. (03)

- i) Draw a labelled figure showing information of the following statement and write the antecedent and the consequent. 'Two equilateral triangles are similar'.

- ii) From the given information in figure find the measures of $\angle p$, $\angle q$ and $\angle r$.

