GEOMETRY (Set A)

Note : *Please see to Question Paper March 2009.*

Q. 1 : Solve any six sub-questions : (12)
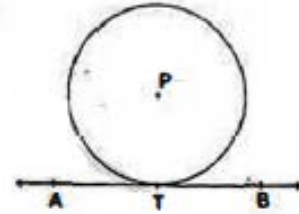
(i) In the △ABC, a line parallel to the side BC intersects the sides AB and AC in the points M and N respectively, such that AM = 8, MB = 12, AN = 6. Find NC.
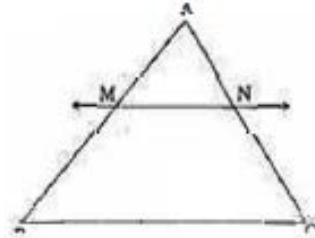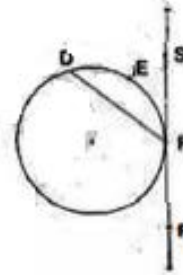
(ii) Find the diagonal of a square whose side is 20 cm.

(iii) In the figure, P is the centre of the circle and line AB is the tangent to the circle at the point T. The radius of the circle is 5 cm. Find the distance of P from the line AB. Give reason.

(iv) In the given figure, m(arc DEF) = 140°, then find m ∠ DFS. Gives reason.

(v) Draw ∠ABC = 65°. Construct the bisector of ∠ABC. (Do not write construction)

(vi) If $\cos A = \dfrac{3}{5}$, find sin A.

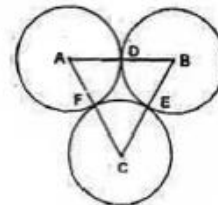(vii) The length, breadth and height of a cuboid are 11 m, 9.5 m and 3 m respectively. Find its volume.

(viii) Find the distance between the points P (2, 1) and Q (- 1, 5).

Q. 2 : Solve any four sub-questions : (12)

(i) In a right-angled triangle, hypotenuse is 61 cm and one side is 11 cm. Find its other side and the area of the triangle.

(ii) Three congruent circles with centres A, B and C and with radius 4 cm each, touch each other in points D, E, F as shown the figure.
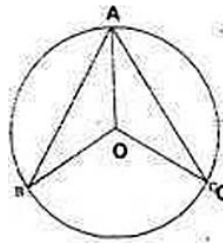(a) What is the perimeter of △ABC?
(b) What is the length of side DE of △DEF?

(iii) Evaluate : $\sin^2 38 + \sin^2 52$.

(iv) What is the volume of a cylinder with radius 8 cm and height 28 cm ? $\left(\pi = \dfrac{22}{7} \right)$

(v) In the given figure, A, B and C are three points on a circle with centre O such that m∠AOB = 110°, m∠AOC = 120°. Find m∠ BAC.
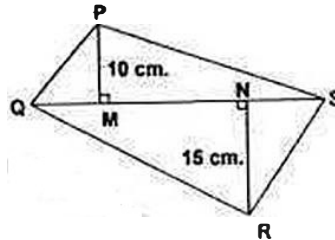
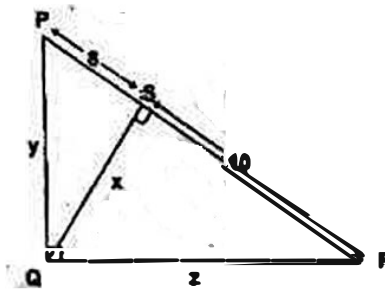(vi) Draw a tangnt to a circle with centre O and radius 3.2 cm at any point K on the circle.
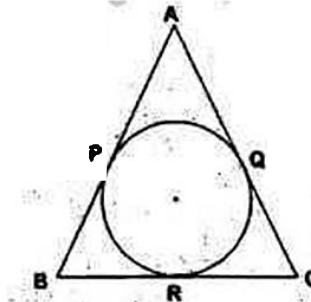
Q. 3 : Solve any four sub-questions : (12)

(i) In the given figure,
A (△PQS) - 100 cm².
Find A (△QRS).

(ii) In the figure,
∠PQR = 90°. Seg QS ⊥side PR.
Find values of x, y, z,
if PS = 8, SR = 10.

(iii) In the given figure, △ABC is an isosceles triangle with perimeter 44 cm. The base BC is of length 12 cm. Sides AB and AC are congruent. A circle touches the three sides as shown. Find the length of tangent segment from AS to the circle.

(iv) In the given figure,
Chord AB of the circle is parallel to the tangent at C.
Prove that AC = BC.
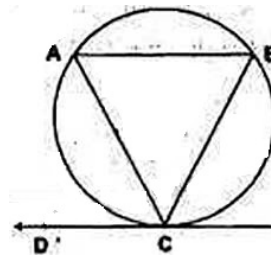
(v) Prove that : $\dfrac{\sin\theta + \tan\theta}{\cos\theta} = \tan\theta (1 + \sec\theta)$.

(vi) G (-4, -7) is the centroid of △ ABC, where A ≅ (-1, -7) and B ≅ (3, 5). Find the coordinates of C.

Q. 4 : Solve any three sub-questions : (12)

(i) If a line divides two sides of a triangle in the same ratio, then the line is parallel to the third side. Prove it.

(ii) Adjacent sides of a parallelogram are 11 cm and 17 cm. Its one diagonal is 26 m. Find its other diagonal.

(iii) In the figure, AB is the diameter of the circle with centre P. Line CB is a tangent and line ADC is a secant. Prove that
$AC \times AD = 4$ (radius)^2.
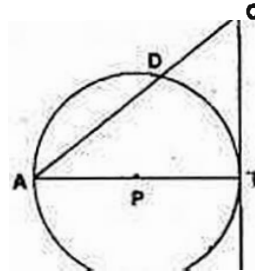
(iv) Oil tins of cuboidal shape are made from a metallic sheet with length 8 m and breadth 4 m. Each tin has dimensions 60 × 40 × 20 in cm and is open from the top. Find the number of such tins that can be made.

(v) The inscribed circle of △ABC touches side AB at L, side BC at M and side AC at N. Prove that

$A(\triangle ABC) = \dfrac{1}{2}$ (perimeter of △ABC × radius of inscribed circle.)
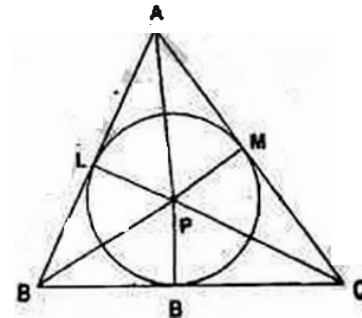
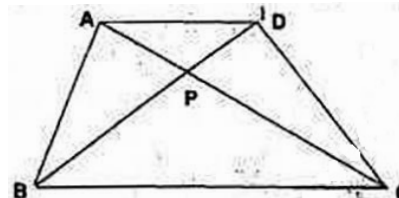(vi) In △ ABC, BC = 5.8 cm, BP ⊥ AC, CQ ⊥ AB, BP = 5 cm, CQ = 4.8 cm. Construct △ABC (Do not write construction)

Q. 5 : Solve any three sub-questions (12)

(i) In □ABCD, side BC ‖ side AD. Diagonals AC and BD interest each other at the point P. If $AP = \dfrac{1}{3}$ AC,

then prove that $DP = \dfrac{1}{2} BP$.

(ii) Prove that the opposite angles of a cyclic quadrilateral are supplementry.

(iii) Draw a circle with centre M and radius 2.7 cm. Take a point P such that length of seg PM is 7.5 cm. Draw tangents to the circle through P. Dra a circle that touc es the given circle and the tangents. (Do not write construction)

(iv) A tree breaks due to a storm and the broken part bends so that the top of the tree touches the ground making an angle of 30° with the ground. The distance from the foot of the tree to the point where the top touches the ground is 10 m. Find the height of the tree.

(v) Plastic drum of a cylindrical shape is made by melting spherical solid plastic balls A redius 1 cm. Find the number of balls required to make a drum of thickness 2 cm, height 90 cm and other

radius 30 m. (Drum has no lid.) $\left(\pi = \dfrac{22}{7}\right)$

(vi) If (- 7, 6), (8, 5) and (2, - 2) are the midpoints of the sides of triangle, find the coordinates of its centroid.