EDUTECH ACADEMY
NURTURING THE FUTURE...
— Classes 5 to 10 —

SET B

N 926

Seat No. | | | | | | | |

2025 XII 30 1100 – N 926 – MATHEMATICS (71) GEOMETRY– PART II (E)

(NEW COURSE)

Time : 2 Hours **(Pages 6)** **Max. Marks : 40**

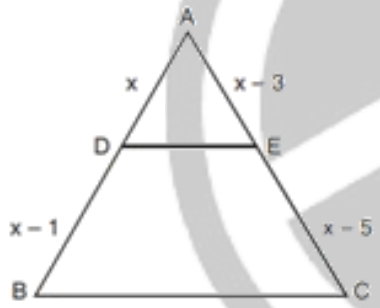
Note :- (i) All questions are compulsory.
(ii) Use of calculator is not allowed.
(iii) Total marks are shown on the right side of the question.

Q.1 (A) Choose the correct alternative: **4**

(1) In ΔPQR, seg PM is a median. PM = 7 and $PQ^2 + PR^2 = 340$. Find QR.
(a) 16 units (b) 22 units (c) 11 units (d) 32 units

(2) If a tangent has to be drawn to a circle without using centre, a _____ is drawn in a circle.
(a) circle (b) tangent (c) rectangle (d) triangle

(3) In ΔABC, DE || BC. In the figure the value of x is_____.



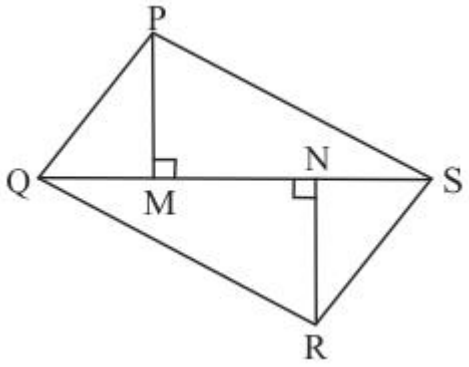
(a) 1 (b) 3 (c) – 1 (d) – 3

(4) The ratio of circumference and area of a circle is 2:7. Find its circumference.

(A) 14 π (B) $\frac{7}{\pi}$ (C) 7 π (D) $\frac{14}{\pi}$

(B) Solve the following: **4**

(1) In figure below, PM = 10 cm A(ΔPQS) = 100 sq. cm A(ΔQRS) = 110 sq. cm then find NR.



(2) The ratio of corresponding sides of similar triangles is 3 : 5, then find the ratio of their areas.

(3) Find the Y –co–ordinate of the centroid of a triangle whose vertices are (4, -3), (7, 5) and (-2, 1).

(4) Prove the following: $\tan^4\theta + \tan^2\theta = \sec^4\theta - \sec^2\theta$

Q.2 (A) Complete the following activities:(Any TWO) **4**

(1) Complete the following activity to prove: $\cot\theta + \tan\theta = \text{cosec}\,\theta \times \sec\theta$

$$\text{L.H.S.} = \cot\theta + \tan\theta$$

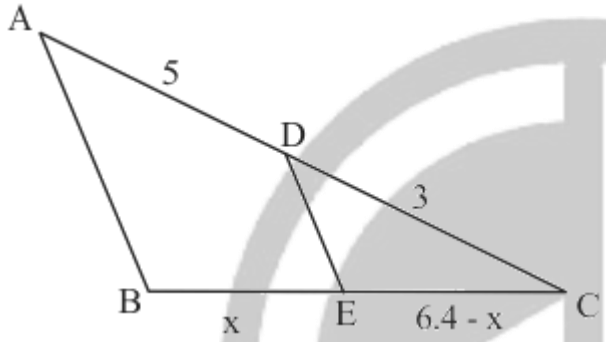
$$= \frac{\cos\theta}{\sin\theta} + \frac{\square}{\cos\theta} = \frac{\square + \sin^2\theta}{\sin\theta \times \cos\theta}$$

$$= \frac{1}{\sin\theta \times \cos\theta} \quad \ldots\ldots \because \square = \frac{1}{\sin\theta} \times \frac{1}{\cos\theta}$$

$$= \square \times \sec\theta$$

$\therefore$ L.H.S. = R.H.S.

(2) In figure below A – D – C and B – E – C seg DE ∥ side AB If AD = 5, DC = 3, BC = 6.4 then find BE.



Let BE = x units [supposition]

BC = BE + CE [B – E – C]

$\therefore$ 6.4 = x + CE

$\therefore$ CE = (6.4 – x) units

In ΔABC, seg DE ∥ side AB [Given]

$$\therefore \frac{AD}{DC} = \frac{BE}{EC}$$

$$\therefore \frac{5}{3} = \frac{x}{\square}$$

$\therefore$ 5(6.4 – x) = 3x

$\therefore$ $\square$ x 5 – 5x = 3x

$\therefore$ 6.4 x 5 = 3x + $\square$

$$\therefore \frac{6.4 \times 5}{8} = x$$

$\therefore$ x = $\square$

$\therefore$ BE = 4 units

(3) How many solid cylinders of radius 6 cm and height 12 cm can be made by melting a solid sphere of radius 18 cm ?

Activity: Radius of the sphere, r = 18 cm
For cylinder, radius R = 6 cm, height H = 12

$\therefore$ Number of cylinders can be made = $\frac{\text{Volume of the sphere}}{\square}$

$= \frac{\frac{4}{3}\pi r^3}{\square}$

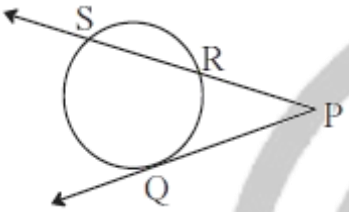
$= \frac{\frac{4}{3} \times 18 \times 18 \times 18}{\square}$

$= \square$

(B) Solve the following: (Any FOUR) **8**

(1) Draw a circle of radius 3.6 cm. Draw a tangent to the circle at any point on it without using the centre.

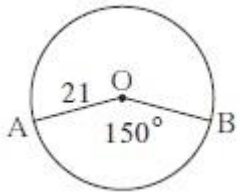
(2)



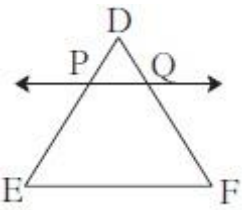
In the figure Q is the contact point. If PQ = 12, PR = 8, then PS = ?

(3) In trapezium ABCD, side AB ∥ side PQ ∥ side DC, AP = 15, PD = 14, QC = 14, find BQ.

(4) The measure of a central angle of a circle is 150 ° and radius of the circle is 21 cm. Find the length of the arc and area of the sector associated with the central angle.



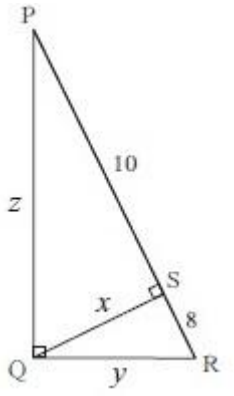
(5)



In Δ DEF, line PQ || side EF, If DP = 2.4, PE = 7.2, PQ = 1 then find QF.

Q.3 (A) Complete the following activity:(Any ONE) **3**

(1) In the figure below .In Δ PQR, ∠ PQR = 90°, seg QS ⊥ seg PR then find x, y, z.



In Δ PQR, ∠ PQR = 90°, seg QS ⊥ seg PR

QS = $\sqrt{PS \times SR}$ ..... (theorem of geometric mean)

$= \sqrt{10 \times 8}$

$= \sqrt{5 \times 2 \times 8}$

$= \sqrt{5 \times 16}$

$= \square$

In Δ QSR, by Pythagoras theorem

$QR^2 = QS^2 + SR^2$

$= \left(4\sqrt{5}\right)^2 + 8^2$

$= 16 \times 5 + \square$

$= 80 + 64$

$= \square$

$\therefore$ QR $= \square$

In Δ PSQ, by Pythagoras theorem

$PQ^2 = QS^2 + PS^2$

$= \left(4\sqrt{5}\right)^2 + 10^2$

$= 16 \times 5 + 100$

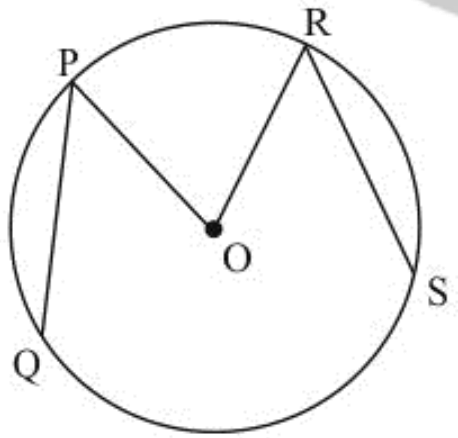
$= 80 + 100$

$= \square$

$= 36 \times 5$

$\therefore$ PQ $= \square$

(2) In figure below, O is the centre of a circle, chord PQ ≅ chord RS If ∠POR = 70° and (arc RS) = 80°, find



(1) m(arc PR)
(2) m(arc QS)
(3) m(arc QSR)

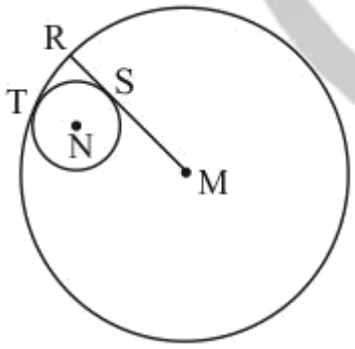
M (arc PR) = m ∠POR
[Definition of measure of minor arc]
∴ m (arc PR) = [ ] 1
Chord PQ ≅ chord [ ] [Given]
∴ ([ ]) ≅ (arc RS)
[In a circle, congruent chords have corresponding minor are congruent]
∴ m (arc PQ) = [ ] 2
M (arc PR) + m (arc RS) + m (arc PQ) + m (arc QS) = 360° [Measure of a circle]
∴ 70° + 80° + 80° + m ([ ]) = 360°
∴ m (arc QS) = 360° - 230°
∴ m (arc QS) = 130° 3
M (arc QSR) = m (QS) + m (arc SR)
[Arc addition property]
∴ m (arc QSR) = 130° + 80°
∴ m (arc QSR) = [ ]

(B) Solve the following: (Any TWO) **6**

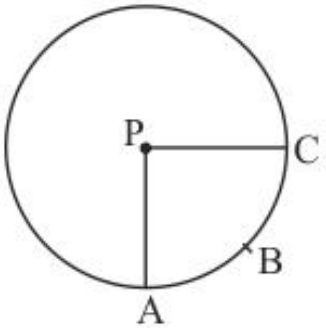
(1) The radius of a circle with centre P is 10 cm. If chord AB of the circle subtends a right angle at P, find areas of the minor segment and the major segment. (π = 3.14)

(2) Find the ratio in which point P(k, 7) divides the segment joining A(8, 9) and B(1,2). Also find k.

(3) In figure below, circle with centre M touches the circle with centre N at point T. Radius RM touches the smaller circle at S. Radii of circles are 9 cm and 2.5 cm. Find the answers to the following questions hence find the ratio MS:SR.
(1) Find the length of segment MT
(2) Find the length of seg MN
(3) Find the measure of ∠NSM.



(4) In the figure below, If A(P – ABC) = 154 cm² radius of the circle is 14 cm, find (1) ∠APC. (2) l(arc ABC)

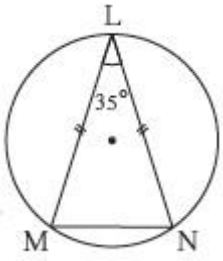


Q.4 Solve the following: (Any TWO) **8**

(1) Find the coordinates of the points which divide the line segment joining the points (-2, 2) and (6, -6) in four equal parts.

(2) The area of the base of a cone is 78.5 cm^2. Its slant height is 7 cm. Find total surface area and height of the cone.

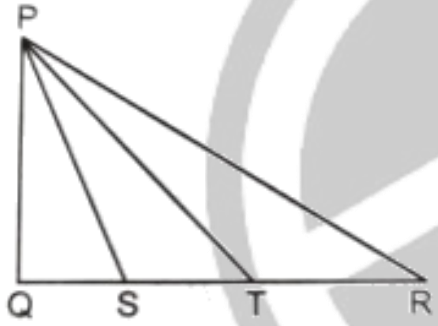
(3) In figure below, chord LM ≅ chord LN ∠L = 35° find
(i) m(arc MN)
(ii) m(arc LN)



Q.5 Solve the following: (Any ONE) **3**

(1) The angle of elevation of a jet plane from a point on the ground is 60°. After a flight of 30 sec, the angle of elevation changes to 30°. If the jet plane is flying at a constant height of $3600\sqrt{3}$m , find the speed of the jet plane.

(2) In the given figure, ΔPQR is right angled at Q and the points S and T trisect the side QR. Prove that $8PT^2 = 3PR^2 + 5PS^2$



....All The Best....