MKCL Creating a Knowledge Lit World www.mkcl.org	**Subject – Geometry** **Std. – 10th EM/Semi**	**Set – I** **Time: 2 Hrs.** **Marks: 40**

Q.1 Choose the correct alternative. **[4]**

1) ∠ACB is inscribed in arc ACB of a circle with centre O. If ∠ACB = 65°, find m(arc ACB).
A) 65° B) 130° C) 295° D) 230°

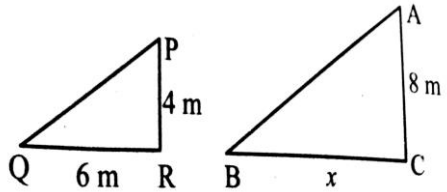
2) ΔABC ~ ΔDBE and $\frac{AB}{DB} = \frac{5}{7}$ then ☐
A) ∠CAB < ∠EDB B) ∠CAB > ∠EDB
C) ∠CAB ≅ ∠EDB D) ∠CAB ≤ ∠EDB

3) When we see below the horizontal line, then the angle formed is _____.
A) a zero degree angle B) the angle of depression
C) the angle of elevation D) a straight angle

4) The line joining the points (1, −5) and (4, −3) is parallel to the line joining the points
A) (2, 0) and (0, −3) B) (−2, 0) and (0, −3)
C) (−3, 0) and (0, −2) D) (−3, 0) and (0, 2)

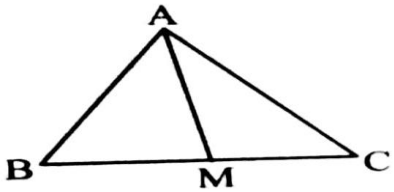
Q.2 Solve any TWO of the following: **[4]**

1) As shown in the figure, two poles of height 8 m and 4 m are perpendicular to the ground. If the length of shadow of smaller pole due to sunlight is 6 m, then how long will be the shadow of the bigger pole at the same time?



2) Find k, if R(1, −1), S(−2, k) and slope of line RS is −2.

3) Seg AM is a median of ΔABC. If AB = 22, AC = 34, BC = 24, find AM.



Q.3A Complete any TWO of the following activities: **[4]**

1) Prove that the chords corresponding to congruent arcs of congruent circles are congruent. Fill in the boxes.

Given: In congruent circles with centres B and R, arc APC ≅ arc DQE

To prove: chord AC ≅ chord DE

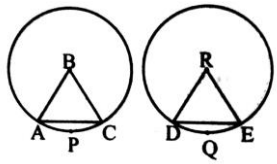
Proof: In ΔABC and ΔDRE,

☐ ≅ ☐ ┐
☐ ≅ ☐ ┘ .....[Radii of congruent circles]

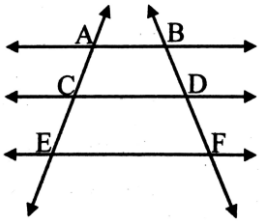
∠ABC ≅ ∠DRE .....[Measures of congruent arcs]

∴ ΔABC ≅ ΔDRE ..... [☐]

∴ chord AC ≅ chord DE ..... ☐



2) In the adjoining figure, AB ∥ CD ∥ EF.
If AC = 5.4, CE = 9, BD = 7.5, then find DF.



AB ∥ CD ∥ EF .....[Given]

$\therefore \frac{AC}{\square} = \frac{\square}{DF}$ ..... $\frac{\square}{\square}$

$\frac{5.4}{9} = \frac{\square}{DF}$

$\therefore DF = \frac{7.5 \times 9}{5.4}$

$\therefore DF = \square$

3) **Fill in the blanks to prove the following:**

$\frac{\tan^3\theta - 1}{\tan\theta - 1} = \sec^2\theta + \tan\theta$

Proof: L.H.S. $= \frac{\tan^3\theta - 1}{\tan\theta - 1}$

$= \frac{(\tan\theta - 1)\square}{\tan\theta - 1}$

...[$\because a^3 - b^3 = (a - b)$ $\square$]

$= \square$

$= \square + \square$

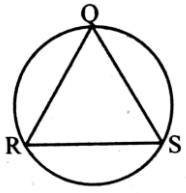
$= \square + \tan\theta$

$= R.H.S.$

$\therefore \frac{\tan^3\theta - 1}{\tan\theta - 1} = \sec^2\theta + \tan\theta$

Q.3B Solve any TWO of the following **[4]**

1) In the adjoining figure, ΔQRS is an equilateral triangle. Prove that,
i) arc RS ≅ arc QS ≅ arc QR
ii) m(arc QRS) = 240°.



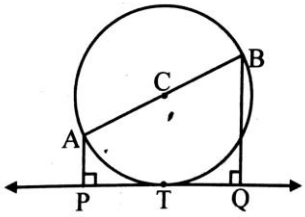
2) The area of a minor sector of a circle is 3.85 cm^2 and the measure of its central angle is 36°. Find the radius of the circle.

3) Draw a circle with centre P. Draw an arc AB of 100° measure. Draw tangents to the circle at point A and point B.

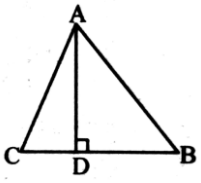
Q.4 Solve any THREE of the following: **[9]**

1) Find the co-ordinates of the points of trisection of the line segment AB with A(2, 7) and B(−4, −8).

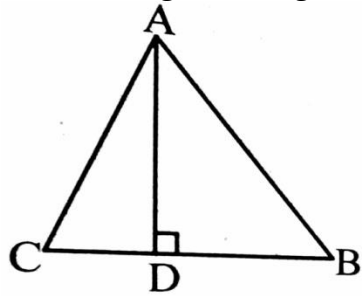
2) In the adjoining figure, seg AB is a diameter of a circle with centre C. Line PQ is a tangent, which touches the circle at point T. Seg AP ⊥ line PQ and seg BQ ⊥ line PQ. Prove that seg CP ≅ seg CQ.



3) In ΔABC, seg AD ⊥ seg BC and DB = 3 CD. Prove that:
$2\ AB^2 = 2\ AC^2 + BC^2$.



4) In ΔABC, seg AD ⊥ seg BC and DB = 3 CD. Prove that : $2AB^2 = 2AC^2 + BC^2$



Q.5 Solve any ONE of the following **[4]**

1) A pilot in an aeroplane observes that Vashi bridge is on one side of the plane and Worli sea-link is just on the opposite side. The angle of depressions of Vashi bridge and Worli sea-link are 60° and 30° respectively. If the aeroplane is at a height of $5500\sqrt{3}$ m at that time, what is the distance between Vashi bridge and Worli sea-link?

2) A cylindrical jar of radius 10 cm is filled with water upto a height of 15 cm. 14 spherical balls of radius 3 cm each are immersed in the jar. Find the new level to which water is filled in the jar.

Q.6 Solve any ONE of the following. **[3]**

1) Draw a circle with radius 2.5 cm & a circle with radius 4 cm. Let these two circles intersect each other in points A & B. Draw a line through A, Let it intersect smaller circle in point C & bigger circle in point D. Draw a line through B, let it intersect smaller circle in point M & bigger circle in point N. Find m ∠MCD + m∠CDN. Draw your conclusion.

2) The diameter of the base of a right cylindrical bucket is 28 cm and its height is 30 cm. It is full of sand. If the sand in the bucket is poured on the ground, a cone of height 14 cm is formed. Find area of the base of sand cone formed.