

Sample Paper (Session 2017-18)

Time: 3 Hr

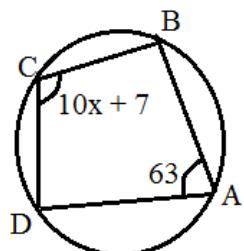
Class: IX Subject: Mathematics

M.M:80

Instruction: The question paper consists of 30 questions divided into four section A, B, C, and D. Section-A comprises of 6 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each ; Section-C comprises of 10 questions of 3 marks each and section-D comprises of 8 questions of 4 marks each.

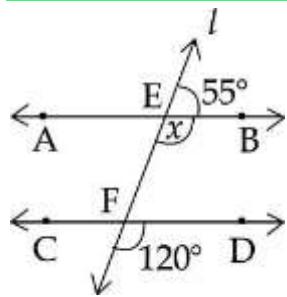
Section A (Q1 – Q-6)(1 x 6 = 6)

1. if $x^2 + kx + 6 = (x + 2)(x + 3)$ for all value of x then find value of K
2. Write the zero of zero polynomial
3. Write the distance of point(0,-3) from origin.
4. The parking charges of a car at Delhi Railway station is Rs.50 for first 3 hours and Rs.10 for subsequent hours. If for x hours parking charge is `y, then write a linear equation in two variables, which represent this information.
5. The radius and the lateral surface area of right circular cone are 8 cm and 220 cm² respectively. Find its slant height.
6. In fig ABCD is a cyclic quadrilateral such that $\angle BAD = 63^\circ$. Find value of x



Section B (Q7 – Q-12) (2 x 6 = 12)

7. Rationalise the denominator of $\frac{6 - 4\sqrt{2}}{6 + 4\sqrt{2}}$
8. Two lines AB and CD are intersected by a transversal / in the figure. Find the value of x and then show that the lines are not parallel.



9. Consider two postulates given below:

- (i) Given any two distinct points R and S, there exists a third point T which is in between R and S.
 - (ii) There exist at least three points which are not in the same straight line and answer the following questions :
- (a) Do these postulates contain any undefined terms ? (b) Do they follow from Euclid's postulates ? Explain.

Ans: 9. (a) The postulates (I) undefined terms like "between A and B". It is unclear where point C lies - on the line AB , Above or below line AB. There are other undefined term like point, line etc.

(b) Both postulate are consistent as they do not oppose each other and refer to two different situation These postulates do not follow from Euclid's postulates. They follow from the axiom, "Given two distinct points, there is a unique line that passes through them".

10. An isosceles triangular field's perimeter is 250 m and each equal side is 100 m. Find the area of the field. (Use $\sqrt{15} = 3.87$)

11. Plot the point (- 5, 1) and from it draw PM and PN perpendicular to x-axis and y-axis respectively. Write the co-ordinates of M and N.

12. A die is thrown 50 times and it showed the number of 23 times. Find the probability of getting a number other than 1 in the next throw of the die.

Section C (Q13 – Q22) (3 x 10 = 30)

13. The auto fare in a city are as follows : For the first kilometer it is Rs. 10 and for subsequent distance is Rs. 8 per km. Taking the distance as y km. and total fare as Rs. x, write a linear equation for this and draw the graph. Also find the fare of 15 km.

14. In $3x + 2y = 12$, express y in terms of x. Find three solutions for this equation. Also find a point where it cuts the x-axis.

15. Draw a line segment QR = 5 cm. Construct perpendiculars at point Q and R respectively. Name them as QX and RY. Are they both parallel ?

16. DEFG is a quadrilateral such that diagonal DF divides it into two parts of equal areas. Prove that the diagonal DF bisects GE.

17. Along a path, 100 conical pillars are constructed. Each pillar has base radius 14 cm and height 18 cm. Find the total cost of painting these pillars at the rate of ` 120 per m².

18. Two coins are tossed simultaneously for 360 times. The number of times '2 Tails' appeared was three times 'No. Tail' appeared and number of times '1 tail' appeared is double the number of times 'No Tail' appeared. Find the probability of getting 'Two tails'.

19. Find the values of a and b if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$

20. Factorise: $x^2 + 3\sqrt{3}x + 6$

21. If $x^2 + y^2 = 58$ and $x - y = 10$, then find the value of $x^3 - y^3$

22. A quadrilateral park ABCD has $\angle C = 90^\circ$, AB = 13 m, BC = 12 m, CD = 9 m and AD = 14 m. Find its area.

OR, The shape of cross-section of a canal is a trapezium. If the canal is 10 m wide at the top and 6 m wide at the bottom and the area of the cross-section is 72 m², find its depth.

SECTION-D(Q23 – Q30)(6 x 4 = 24)

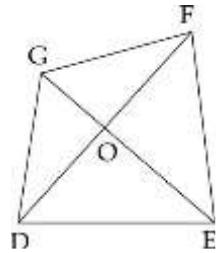
23. Simplify: $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

24. If $(x + 1)$ and $(x + 2)$ are the factors of $x^3 + 3x^2 - 3\alpha x + \beta$, then find α and β

Or, If $(x^2 - 1)$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$, show that $a + c + e = b + d = 0$

25. if $z^2 + \frac{1}{z^2} = 14$, find the value of if $z^3 + \frac{1}{z^3}$ taking only positive value of $z + \frac{1}{z}$

26. The following table shows the life of 400 neon lamps:



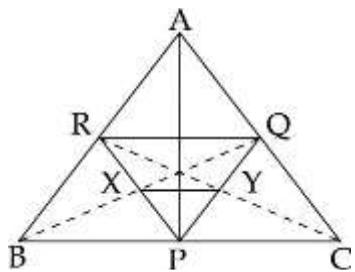
Life time (in hrs)	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
No. of Lamps	14	56	60	86	74	62	48

27. Show that in a right triangle if one of the acute angle is double the other than prove that hypotenuse is double the shortest side.

28. Prove that sum of the two sides of triangle is greater than third.

OR, S is any point interior of triangle PQR, prove that $PQ + PR > QS + RS$

29. In the figure, P, Q and R are the mid-points of sides BC, AC and AB of $\triangle ABC$. If BQ and PR intersect at X and CR and PQ intersect at Y, then show that $XY = \frac{1}{4} BC$.



30. Construct $\triangle ABC$ if $AB = 2.1$ cm, $\angle A = 110^\circ$ and $BC - CA = 0.9$ cm.

Or,

Give reasons :

- (a) Construction of an angle of 22.5° is possible with the help of ruler and compass.
- (b) It is not possible to construct a $\triangle ABC$, given that $BC = 7$ cm, $\angle B = 45^\circ$ and $AB - AC = 10$ cm
- (c) We can construct an angle of 67.5° using ruler and compass.
- (d) Construction of $\triangle DEF$, if $EF = 5.5$ cm, $\angle E = 75^\circ$ and $DE - DF = 2$ cm is possible