

CLASS X

SAMPLE PAPER

MATHS

Max. Marks: 80

Note: (i) This question paper consists of 40 questions divided into 4 sections A,B,C &D.

(ii) Questions in Section A carry 1 mark each, Section B carry 2 marks each, Section C carry 3 marks each and Section D carry 4 marks each.

(iii) There is no overall choice. However, internal choices are provided in 2 questions of Section A, 2 questions of Section B, 3 questions of Section C and 3 questions of Section D.

(iv) Use of calculators prohibited.

Section-A

- If 'p' is a prime factor of a^2 , then
 - P is a multiple of 'a'
 - P is a factor of 'a'
 - 'a' is a factor of 'p'.
 - None of these.
- If 'x' is an odd integer then $x^2 - 1$ is always
 - Divisible by only 8
 - divisible by only 4
 - divisible by 4 or 8
 - divisible by 6
- If α, β are zeroes of the polynomial $3x^2 - 10x + 3$, then $\alpha\beta =$
 - 3
 - 9
 - 1
 - 10
- The co-ordinates of endpoints of diameter of a circle are (-3,4) and (3,-4) the co-ordinates of the centre are
 - (0,0)
 - (3,4)
 - (-3,-4)
 - None of these
- The line segment joining points ((-3,-4) and (1, -2) is divided by the y-axis in the ratio
 - 1 : 3
 - 2 : 3
 - 3 : 1
 - 3 : 2
- If (x,2), (-3,-4) and (7,-5) are collinear then $x =$ _____
 - 60
 - 63
 - 63
 - 60
- If $\tan\theta + \cot\theta = 2$, $\tan^2\theta + \cot^2\theta =$ ___

- a) 2 b) 4 c) - 2 d) 0
8. Value of $\cos^2 35^\circ + \cos^2 55^\circ - 1$ is ____
- a) 1 b) 0 c) 2 d) - 2
9. $\frac{\tan^2 A}{\cot^2 A} =$ ____
- a) 1 b) - 1 c) $\tan^4 A$ d) $\cot^4 A$
10. A bag contains Green, black and blue balls. If the probability of drawing green and black balls are 0.6 and 0.04, probability of drawing blue balls is ____
- a) 0 b) 0,36 c) 0.4 d) 0.07

Q.11-15 (fill in the blanks)

11. Two cubes of edge 3 cm are joined end to end. The total surface area of the resulting cuboid is ____.
12. Discriminant of the equation $ax^2 + bx + c = 0$ is ____
13. Radius at the point of contact is ____ to the tangent.
14. Empirical formula for finding Mode is ____.
15. If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ the graph of a pair of linear equations in two variable will show ____ lines.

Q.16-20 Short answer questions)

16. If $\sqrt{5} = 2.236$ find the value of $\sqrt{20}$.
17. Sum of ages of a father and a son is 50 years. Their difference is 30 years. Find the age of father.

OR

For what value of 'k' the pair of equations $2x + ky = 17 : 5x - 7y = 11$ will have no solution.?

18. For what value of 'k' the equation $9x^2 + 3kx + 4 = 0$ will have real and equal roots?
19. In ΔABC , D and E are midpoints of AB and AC. If $DE = 3$ cm, Find the length of BC.

OR

Prove that radius of incircle of right triangle with sides a, b and c - where ' c ' is the hypotenuse- is given by $\frac{a+b-c}{2}$

20. Three circles of radius 2 cm, 3 cm and 4 cm touch each other externally. Find the perimeter of the triangle obtained by joining their centres.

Section-B

21. Find the zeroes of the polynomial $x^3 - 12x^2 + 39x - 28$, if the zeroes are in A.P.

OR

Find the zeroes of $x^2 + 2\sqrt{2}x - 6$ and verify the relationship with coefficients.

22. Areas of two similar triangles are in the ratio 4 : 9. If the perimeter of the smaller triangle is 24cm find the perimeter of the larger triangle.

OR

ABC is right triangle right angled at A and AD ⊥ BC. Prove that ΔABC similar ΔDBA

23. If $\sin A + \cos A = \sqrt{3}$, show that $\tan A + \cot A = 1$
24. Find the area of sector of a circle of radius 5 cm and central angle 36° . ($\pi = 3.14$)
25. A bag contains 16 white balls, 8 red balls and 6 blue balls. Find the probability of drawing (i) a blue ball (ii) Either a red or white ball.
26. Two coins are tossed together. What is the probability of getting (i) atleast two heads (ii) utmost two tails

Section-C

27. Prove $\sqrt{2}$ is irrational **OR** Prove that square of a positive integer is of the form $3m$ or $3m + 1$ for some integer m .
28. A hollow sphere of internal and external radii 2cm and 4 cm is melted and recast into a cone of radius 4 cm. Find the slant height of the cone.

OR

A spherical ball of radius 3 cm is melted and recast into three spherical balls. If the radii of two spherical balls are 1.5 cm and 2 cm respectively find the diameter of the third ball

29. Construct a triangle ABC in which $AB = 5$ cm $BC = 7$ cm $\angle ABC = 45^\circ$ and construct a triangle similar to ABC with scale factor $7/5$. (Use only ruler and compass)

OR

In a ΔABC, the perpendicular from A meets BC at D such that $BD = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$

30. If $\tan \theta = \sqrt{3}$ find the value of $\frac{1 - \cos^2 \theta}{2 - \sin^2 \theta}$
31. If the vertices of ΔABC are $A(0, -6)$, $B(2, 5)$ and $C(-1, 3)$ and $P(x, y)$ is a point in the interior of the ΔABC show that the ratio of area of ΔPBC to ΔABC is $\frac{2x - 3y + 11}{49}$
32. Sum of a two digit number and the number obtained by reversing the digits is 165. Find the number if the sum of the digits is 15.
33. Find the sum of all 3-digit number that leave remainder 2 when divided by 7.
34. In a trapezium ABCD, diagonals AC and BD intersect at E and $AB \parallel DC$. If ΔAED is similar to ΔBEC show that $AD = BC$.

Section-D

35. Radius of incircle of ΔABC divides one of the sides into two parts of 6 cm and 8 cm. If the radius is 4 cm find the length of the other two sides of the triangle.

OR

Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

36. Cost of motor cycle is Rs.60,000.. Raju agrees to pay one-third of the amount as advance and the rest in 16 equal instalments. If the interest at 5% is charged on the outstanding balance find the cost of the motorcycle.

OR

A boat can go 15km downstream and return in 4 hours. If the speed of the boat in still water is 8km/h find the speed of the stream.

37. Angles of depression of two km stones from the top of a cliff lying on its opposite sides are found to be 60° and 30° . Find the height of the cliff.

OR

Prove : $\frac{\sin \theta}{\cot \theta + \operatorname{cosec} \theta} = 2 + \frac{\sin \theta}{\cot \theta - \operatorname{cosec} \theta}$

38. If the equation $(1 + m^2)x^2 + 2mcx + (c^2 - a^2) = 0$ has equal roots prove $c^2 = a^2(1 + m^2)$

39. If the median of the following data is 41 find the missing frequencies.

10-20	20-30	30-40	40-50	50-60	60-70	Total
5	x	12	15	y	4	55

40. A farmer runs water through a pipe of inner diameter 20 cm from a canal to a cylindrical tank in his field that measures 10 m diameter and 2 m deep. If the water runs at the rate of 3km/h, how much time will it take to fill the tank.