

CLASS X SAMPLE PAPER MATHS

Max.Marks: 80

Section B has 6 questions of 2 marks each, Section C has 10 questions of 3 marks each and Section D has 8 questions of 4 marks each.

All questions are compulsory.

There is no overall choice. However, internal choices are given in 4 questions of 3 marks and 3 questions of 4 marks. Answer any one of the alternatives in such cases.

Section-A

1. For what value of 'm' the HCF of 45 and 63 can be expressed as $45m - 63 \times 2$?
2. Fourth term of an A.P. is 51. The difference between 20th and 12th terms is -32. Find the A.P.
3. Find 'p' if the equation $2px^2 + 6x + 5 = 0$ has equal roots.
4. Diagonals of a trapezium intersect at 'O'. If $\frac{OA}{OC} = \frac{OB}{OD} = \frac{1}{2}$ and AB = 3.5 cm find DC.
5. Three consecutive vertices of a parallelogram are (3,-4), (-1,-3), and (-6,2) find the fourth vertex.
6. If $3 \tan \theta = 4$, find $\frac{3 \sin \theta + 2 \cos \theta}{3 \sin \theta - 2 \cos \theta}$.

Section-B

7. Find the smallest 4-digit number divisible by 15, 25 and 30.
8. Points P(a,-4), Q(-2,b) and R(0,2) are collinear. Q lies between P and R such that PR = 2QR. Find 'a' and 'b'.
9. Determine 'k' such that $k^2 + 4k + 8$, $k^2 + 3k + 6$ and $3k^2 + 4k + 4$ are in A.P.

10. For what values of 'k' the system of equations $x+(k+1)y=5$; $(k+1)x +9y = 8k- 1$, will have infinitely many solutions.

11. 50 cards are numbered 1-50. One card is drawn at random. Find the probability that the drawn card bears (i) a perfect square. (ii) A number divisible by both 2 and 6.

12. All kings from a pack of cards are removed. One card is drawn at random. What is the probability that the drawn card is (i) a face card (ii) A card of hearts suit.

Section-C

13. Prove that square of every positive integer is of the form $3m$ or $3m+1$ for some integer 'm'.

14. Five times a two digit number is equal to six times the number obtained by reversing the digits. If the digits differ by 1, find the number.

15. If α, β are zeroes of the polynomial $3x^2 + 11x -4$, find the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

16. Points A(4,-2), B(7,2), C(0,9) and D(-3,5) form a parallelogram. Find the length of the altitude on AB.

17. ABCD is a trapezium with $AB \parallel DC$. Diagonals AC and BD intersect at E. ΔAED is similar to ΔBEC . Prove that $AD = BC$.

OR

In a ΔABC , $AD \perp BC$ such that $DB = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$

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

Construct a ΔABC in which $AB = 4.5$ cm, $BC = 3.6$ cm and $\angle B = 75^\circ$ and construct a similar triangle $A'BC'$ with scale factor $3/5$.

19. Mean of the following data is 28. Find the missing frequency.

Class Int	0-10	10-20	20-30	30-40	40-50	50-60
Freq	12	18	27	p	17	6

20. If $\tan\theta = \frac{2}{\sqrt{7}}$, evaluate $\frac{\operatorname{cosec}^2\theta - \sec^2\theta}{\operatorname{cosec}^2\theta + \sec^2\theta}$

OR

If $a \sin^3\theta + b \cos^3\theta = \sin\theta \cos\theta$ and $a \sin\theta = b \cos\theta$, prove that $a^2 + b^2 = 1$.

21. ABC is a right triangle right angled at A. with BC = 10 cm and AB = 6cm. An incircle is inscribed in the triangle. Find area of the circle and the remaining part of the triangle.

22. A bucket is in the form of a frustum of a cone whose top and bottom radii are 28 cm and 21 cm respectively. It is 24 cm high and has a cylindrical base that is 6 cm high. Find the area of the metal used to make the bucket.

Section-D

23. A particular length of cloth costs Rs.300. had the cloth been 2 mlongr and the rate Rs.5 lesser, the cost would have remained same. Find the length of the cloth and rate per metre.

OR

A good Samaritan donated RS.4800 to be distributed equally among the children of an orphanage. Had there been 8 children less each would have got Rs.20 more.Find the number of the children in the orphanage. What is the value exhibited by the donor?

24. A motorcycle costs Rs.1,60,000. Raju pays Rs.40,000 as advance and agrees to pay the rest in 8 equal installments. If interest at 4% is charged on the outstanding balance howmuch did Raju pay for the motorcycle?

25. State and prove the converse of Pythagoras theorem. In a $\Delta ABC, \angle A = 90^\circ$ AD \perp BC, prove that $AD^2 = BD \cdot CD$

OR

Prove that areas of two similar triangles are proportional to the squares of corresponding sides.

Areas of two similar triangles are 144cm^2 and 81cm^2 respectively. If one side of the larger triangle is 16 cm find the length of the corresponding side of the smaller triangle.

26. An incircle of a triangle whose radius is 3 cm divides one of the sides of the triangle into two parts of 6cm and 3 cm, find the lengths of other two sides of the triangle.

27. If $\sec\theta + \tan\theta = x$, prove that $\sin\theta = \frac{x^2-1}{x^2+1}$

28. A plane flying at height of 3125m passes vertically below another plane at an instant when the angles of elevation of the two planes from a point on the ground are observed to be 60° and 45° respectively. Find the distance between the planes.

29. The median of the following data is 36. Find the missing frequency.

Class Int	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Freq	4	5	x	20	14	8	4

OR

Draw a less than type Ogive for the given data and find the median from the graph.

Class Int	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Freq	3	6	9	13	8	5	4

30. A cubical building of edge 12 m has hemispherical dome. Find the cost of painting its outer surface given that it has a door 3×2 m and six windows 1.5×2 m at Rs.9.50/m²