

CLASS X

SAMPLE PAPER

MATHS

Max. Marks: 80

Section-A

1. If $T_n = 3n - 2$, what is the Common difference?

OR

If $a = -5$ and $d = -3$ find 5th and 15th terms.

2. If $p = a^3b^4$ and $q = a^2b^3$ - a and b being prime numbers find H.C.F(p,q) and LCM(p,q).
3. Find the Co-ordinates of midpoint of the line joining points (6,-3) and (2,5).
4. A tangent drawn to a circle from a point 7.5 cm away from the centre measures 4.5 cm. Find the radius of the circle.
5. Find a quadratic polynomial whose zeroes are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.
6. If $\tan A + \cot A = 2$ show that $\tan^2 A + \cot^2 A = 2$

OR

If $\tan A = \frac{3}{4}$, find $\frac{4 \sin A + 3 \cos A}{4 \sin A - 3 \cos A}$

7. Find the smallest number that leaves remainders 9 and 18 when divided by 36 and 45 respectively.

OR

Find the smallest 4-digit number that leaves remainder 7 when divided by 32 and 48 respectively.

8. Find the value of 'y' if the distance between the points (6,1) and (2,y) is 10 units.

OR

In what ratio x-axis divides the line joining points joining (5,6) and (2,-8).

9. Two dice are tossed together. Find the probability that the sum of the scores obtained is less than 8.
10. For what value of 'k' the equation $(k-12)x^2 + 2(k-12)x + 2 = 0$ has equal roots.
11. Find the 16th term from the last of A.P 7, 12, 17,.....182.
12. 50 cards are numbered 1-50. One card is drawn at random. What is the probability that the drawn card bears an even multiple of 3.

Section-C

13. AOC is an isosceles right triangle right angled at 'O'. Using OA as radius a quadrant is drawn and using AC as diameter a semicircle is drawn. Find the area enclosed between two arcs if OA = 7 cm.
14. Draw a line segment AB = 7 cm and divide it in the ratio 5 : 3. Measure each part.
15. Show that cube of a positive integer is of the form $3m$ or $3m + 1$ for some integer 'm'.

OR

Show that only one of $n+1$, $n+2$, $n+3$ is divisible by 3

16. Which term of the A.P 64,60,56,... is the first negative term?

OR

A factory produces 700 units in the first year, 750 in the second and 800 in the third year and so on. How many units will be produced in the ninth year and how many units are produced in six years?

17. Show that the points A(1,-3), B(-3,0) and C(4,1) are vertices of a right isosceles triangle.

OR

Find the area of a quadrilateral whose vertices are (-5,7), (-4,-5), (-1,-6) and (4,5).

18. A circle is inscribed in a quadrilateral ABCD touching its sides. Show that the sum of its opposite sides are equal.

OR

Prove that tangents drawn to circle from an exterior point are (i) equal in length, (ii) inclined at the same angle to the line joining the point with the centre of the circle.

19. Mean of the following data is 1080. Find the missing frequency.

Class Interval	800-900	900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500
Freq	10	15	8	12	x	5	3

20. A park is in the form of a square of side 80 m. There are four circular flower beds at each corner and a circular flower bed in the centre of the park. If the radius of each of circular beds is 7 m find the remaining area of the park.

21. Prove that : $\frac{2}{\cos^2 A} - \frac{1}{\sin^2 A} + \frac{2}{\sin^4 A} = \cot^4 A - \sin^4 A$

22. Five times a two digit number is equal to 6 times the number obtained by reversing the digits. Find the number if the sum of the digits is 9.

Section-D

23. Raju travels 500 km to his home partly by train and partly by car. If he had travelled 200 km by train and rest by car he would have reached his home in $5\frac{3}{4}$ hours. But had he travelled 200 km by car and rest by train he would have reached 15 minutes earlier. Find the speeds of car and train.

OR

A plane left 30 minutes late due to inclement weather. In order to reach its destination 3000 km away on time the speed of the plane was increased by 200 km/h. Find the usual speed of the plane.

24. Solve for 'x' and 'y': $\frac{10}{x+y} + \frac{2}{x-y} = 4$; $\frac{15}{x+y} - \frac{5}{x-y} = -2$
25. A circle is inscribed in a triangle. The radius of the circle which is perpendicular to one of the sides is 3 cm and divides the side into two parts of 9 cm and 4 cm find the length of the other two sides of the triangle.
26. Height of a cone is 40 cm. A small cone is cut off at the top by a plane parallel to the base. If the volume of the small cone is $\frac{1}{64}$ volume of the given one at what height the section is made?
27. A man standing on the deck of a boat 30 m above the lake observes angle elevation of a cloud to be 30° and the angle of depression of its reflection in the water to be 60° . Find the height of the cloud. ($\sqrt{3} = 1.732$)

OR

Two poles of equal height stand on the opposite edges of a street 80 m wide. From a point on the road-between the poles- the angles of elevation of the tops of the poles were observed to be 60° and 30° respectively. Find the heights of the poles and the position of the point.

28. State and prove Pythagoras theorem

OR

ABC is right triangle right angled at B, D and E are points on BC such that $BD=DE=EC$. Prove that $8AE^2 = 3AC^2 + 5AD^2$

29. A circus tent whose base diameter is 14 m is cylindrical upto a height of 5 m and conical above it. If the slant height of conical part is 42 m find the area of canvas used to make the tent. Also find the cost of canvas if the width is 5m, at Rs. 15/m.
30. A LIC agent has the following data for 100 policy holders in a locality. Find the median of the data.

Age (in years)	No. of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100

Minimum and maximum age for giving a policy 18 years and 60 years respectively.