CLASS X
SAMPLE PAPER
MATHS

Max. Marks: 80

Section-A

1. If 'a' and 'b' are two positive integers such that a is a factor of b, then find their LCM.

OR

 Can two numbers have HCF 12 and LCM 128? Give reason

2. When a biquadratic polynomial is divided by a quadratic polynomial, what will be the form of remainder?

3. Find the distance of the point (4, 3) from the origin.

4. Sides of two similar triangles are in the ratio 4 : 9. What will be the ratio of their areas?

5. If $\sin\theta = \cos\theta$, find value of $\cot\theta - \cos^2\theta$.

6. For what vaue of 'k' the equation $4x^2 + kx +k=0$ will have equal roots.

OR

 Find the value of 'p' if the sum of the roots of the equation $x^2 +2x - p = 0$ is $- 2$.

Section-B

7. Find the ratio in which *x-axis* divides the line joining the points (6,4) and (2,-8)

OR

 If P(x,y) is equidistant from points (5,2) and (-3,4) find a relation between x and y.

8. A bag contains 4 red balls, 7 green and 9 blue balls. One balls drawn at random. What is the probability that the drawn ball is (i) red (ii) not red?

9. Find the largest 3-digit number that leaves remainder 3 when divided by 8, 12 and 16.

10. Fifty cards are numbered 1-50. One card is drawn at random. Find the probability that the drawn card bears a (i) a prime number (ii) a number divisible by both 2 and 3.

11. Fourth term of an A.P is 51. If the difference between 20th term and 12th term is – 32, find A.P

OR

Find the 15th term from the last of A.P. 17,20,23,26…………176.

12. For what value of 'k' the system of equations x + 2y =4 : 4x +ky =2k will have infinitely many solutions?

Section-C

13. Prove that √2 is irrational.

14. On dividing x^3- $3x^2$ + x + 2 by a polynomial *g(x),* the quotient and remainder were *x – 2 and -2x + 4* respectively. Find *g(x).*

OR

Check whether x^2 + 3x + 1, is a factor of $3x^4$ + $5x^3$ – $7x^2$ + 2x + 2.

15. Find the area of the triangle whose vertices are (6, 4), (2, -8) and (-4, 3).

16. An isosceles triangle has its equal sides measuring 7 cm each. Using one of the sides as radius and right vertex as centre a quadrant is drawn and using hypotenuse as diameter a semicircle is drawn. Find the area between quadrant and semicircle.

17. The area of a square on the side of a triangle is equal to the sum of the areas of squares on the other two sides. Prove that angle opposite to the first side is a right angle.

OR

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

18. Show that sin(55° + A) –cos (35° –A) + tan 5° tan 35° tan 55° tan 85° = 1

19. A circle is touches the side BC of ΔABC at P and touches sides AB and AC produced at Q and R. prove that AQ = ½ Perimeter of ΔABC.

20. Prove $(\sin A + \sec A)^2 + (\cos A + \csc A)^2 = (1 + \sec A \csc A)^2$

OR

Prove $\dfrac{\sin A + \cos A}{\sin A - \cos A} + \dfrac{\sin A - \cos A}{\sin A + \cos A} = \dfrac{2}{2\sin^2 A - 1}$

21. All the face cards are removed from a well shuffled pack of cards. One card is drawn at random. What is the probability that the drawn card is a) a red card, b) an ace c) a card bearing number 8?

22. Find the mode of the following data;

Age (Yrs)	10-20	20-30	30-40	40-50	50-60	60-70
	60	42	55	70	53	20

OR

Mean of the following data is 18. Find the missing frequency.

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

Section – D

23. From a window 20m above the ground the angles of elevation and depression of a building on the opposite side of the street are 45° and 60° respectively. Find the width of the street and height of the building.(√3 = 1.732)

OR

A ladder rests against a wall making an angle α to the horizontal. Its foot is pulled away from the wall through a distance of 'α' metres, sothat it slides down the wall by $\frac{1}{3}a$ metres making an angle β to the horizontal show that $\dfrac{3\sin\alpha + \cos\alpha}{3\sin\beta + \cos\beta} = 1$

24. The median of the following data is 51. Find the missing frequencies.

Class Int	20-30	30-40	40-50	50-60	60-70	70-80	Total
Freq	3	12	X	20	y	7	70

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25. A copper wire of 3.5 mm diameter is wound round a cylindrical rod of radius 7 cm height 21 cm to cover its entire curved surface. Find the volume of the wire.

26. From a point 'O' in the interior of the ΔABC perpendiculars OD, OE and OF are drawn to sides BC, AC and AB respectively. Prove that $AF^2 + BD^2 + CE^2 = (OA^2 + OB^2 + OC^2) - (OD^2 + OE^2 + OF^2)$

27. A train covered a distance of 120 km with a uniform speed. After that due to a technical snag it ran with four-fifth the original speed and arrived at its destination 42 minutes late. Had the technical snag occurred after covering 80 more kms then it would have arrived at the destination 12 minutes earlier. Find the speed of the train and length of journey.

OR

A boat can go 30 km downstream and 24 km upstream in 9 hours. However, it can also go 25 kms downstream and 16 kms upstream in 6 ½ hours. Find the speeds of the boat and stream.

28. Solve graphically: 2x + 3y = 9 ; 2x + y = 5

29. Solve for 'x' ; $\frac{2x+3}{2x+5} - \frac{x}{x+1} = \frac{1}{2x+3}$

OR

Two pipes can fill a tank in $3\frac{1}{13}$ hours if one pipe takes 3 hours more than the other to fill the tank separately, find the time taken by each tow fill the tank separately.

30. A Person borrowed Rs. 60,000 to be repaid in 50 instalments that form an A.P. After paying 30 instalments the person dies leaving ¼ of the loan unpaid. Find the value of the first Instalment.