CLASS X
SAMPLE PAPER
MATHS

Max.Marks:80

Section-A

1. Find tenth term from the last of A.P. 7,12,17,22,……152.

   OR

   If 1 is a root of the equation $3x^2 + kx - 3 = 0$, find 'k'.
2. Find the co-ordinates of the midpoint of the line segment joining A(-8, 3) B(2,-5).
3. Two similar triangles have area 144 cm^2 and 81 cm^2 respectively. If the perimeter of the smaller triangle is 16 cm find the perimeter of the other triangle.
4. If $2\cos2\,\theta = \frac{3}{2}$, find θ   **OR** If $\cos\theta$ = ¾, find $\sin\theta$.
5. Product of two numbers is 1728. If their H.C.F is 12, find their L.C.M.
6. If the polynomial $ax^2 + bx + c$ has both zeroes positive what would be sign of 'b'?

Section- B

7. Thirty cards are numbered 1 – 30. One card is drawn at random. What is the probability that the drawn cards bears (i) an even prime number (ii) a number which is exactly product of two different prime numbers?
8. Show that 13 x 17 x 19 x 23 + 13 x 23 is a composite number

   OR

   Find the largest number that divides 137 and 170 leaving remainders 2 and 5 respectively.
9. A bag contains 8 black balls and some green balls. By adding 5 more green balls the probability of drawing a green ball exceeds the probability of drawing a black ball by $\frac{1}{5}$. Find the original number of green balls.
10. If α,β are zeroes of the polynomial $x^2 – 3x – 5$, find a polynomial whose zeroes are (α+1) and (β + 1)   **OR**

    If α,β are zeroes of the polynomial $3x^2 – 5x – 8$, find the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$.
11. If one root of the equation ax2 + bx + c = 0 is double the other root show that $2b^2 = 9ac$
12. If the points (7, -2), (5,1) and (3,k) are collinear find 'k'.

Section-C

13. Given √3 and √5 are irrational, prove √5 - 2√3 is irrational.

    OR

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Prove that cube of a positive integer is of the form 9m,9m +1 or 9m+8 for some integer 'm'.

14. What should be added to p(x) = x^4 + $2x^3$ – $2x^2$- 5x +7 so that the resulting polynomial becomes exactly divisible by f(x)= x^2 + 2x – 3 ?

15. For what values of '*a*' and '*b*' the following pairs of equation will have infinitely many solutions? 2x + 3y = 7 ; 2ax + by = 28 – by.

OR

Four times a two digited number is equal to seven times the number obtained by reversing the digits. If the sum of the digits is 6 find the number.

16. From a point A, the angle of elevation of the top of a vertical tower situated on the roof of 50 m high building is found to be θ. After walking some distance towards the tower the angle of elevation of bottom of tower from point B is also found to be θ. Find the height of the tower.

17. Vertices of a quadrilateral ABCD are A(-5,7), B(-4,-6), C (-1, -6) and D(4,5) find its area.

OR

Find the ratio in which the line 3x + y -9 =0, divides the line segment joining the points A(1,3) and B(2,7).

18. Construct a triangle ABC in which AB = 4cm, BC = 5 cm and AC = 6 cm and then construct a triangle A'BC' similar to ABC with scale factor 7/5.

19. ABC is a triangle and AD is median on BC. Prove that AB^2 + AC^2 =2(AD^2+BD^2)

20. ABC is triangle right angled at B, with BC = 5 cm and AB = 12 cm. With BC as radius a quadrant has been drawn and with AC as diameter a smicircle(outwards) has been drawn. Find the area enclosed by two arcs.

OR

A square card board has a side of 10 cm. One cm away from each side a design comprising 4 semicircles of same radius, such that the ends of semicircles touch each other. Find the area of the remaining card board. (π= 3.14)

21. Three spherical balls of same diameter are inserted into a cylindrical tube one above the other such that they touch the bottom as well as the edges of the tube and the top one exactly touches the lid when closed. If the volume of each ball is 180 cm^3, find the volume of the cylinder.

22. If the mean of the following data is 41.4, find the missing frequency.

Class Int	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Freq	3	5	x	7	8	14	7

Section-D

23. Rajan's annual salary in 2008 is Rs.40,000 and increases each year by Rs.4000.In the beginning of 2008 Rajan took a loan of Rs. 44,000 form the company. Find in how many

years Rajan would repay the loan given (a) Interest at the end of 2008 is Rs.3600 and increases every year by Rs.800 thereafter. (b) Rajan pays 20% of his annual income every year towards repayment of loan.

24. A rowing boat can go 55 km down stream and 20 km upstream in 9 hours. It can also go 33 km downstream and 30 km upstream in 9 hours. Find the speed of the boat ant the speed of the stream.

OR

Solve of 'x'.: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$

25. From a window 20m above the ground the angles of elevation and depression of top and bottom of a building on the opposite side of the street were found to be 45^0 and 60^0 respectively. Find the height of the building and width of the street.

26. If cosec θ + cot θ = p, prove cos θ = $\frac{p^2-1}{p^2+1}$

27. Prove that areas of two similar triangles are proportional to the squares of corresponding sides. **OR**
Diameter AOB of a circle-with centre O- is produced to D. DC is a tangent tangent to the circle. If ∟BAC = 30^0, prove that BD = BC.

28. Median of the following data is 47.5. Find the missing frequencies.

Cl.Int	0-15	15-30	30-45	45-60	60-75	75-90	Total
Freq	5	6	x	12	8	y	46

29. A metal bucket is in the form of a frustum of a cone whose top and bottom radii are 28 cm and 21 cm respectively. If the bucket is 24 cm high find the area of the metal used to make the bucket and the cost of the bucket at Rs.20 per 100 m^2.

30. Prove the basic proportionality theorem. Using the result prove that bisector of an interior angle of a triangle divides the opposite side in the same ratio as the sides containing the angle.

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