

SECTION – A

- Two polygons having same number of sides and corresponding sides proportional are similar or not?
- If $\sec 2A = \operatorname{cosec} (A - 36)$, find A.
- Write the expression in simplest form: $\sec^2\theta - \frac{1}{\operatorname{cosec}^2\theta - 1}$
- Find the sum of upper limit and lower limit of the class interval in which the 20th observation of the following data lies:

Class interval	0-100	100 – 200	200 -300	300 - 400	400-500	500-600	600-700
Frequency	5	7	6	3	20	4	8

SECTION-B

- Write the decimal expansion of $\frac{27}{1250}$ without actual division.
- What is the condition for the decimal expansion of a rational number to terminate? Explain with the help of an example.
- α and β are zeroes of the polynomial $x^2 - p(z+1) + 4 = c$ such that $(\alpha + 1)(\beta + 1) = 0$, then find the value of c.
- If $x = p \sec \theta + q \tan \theta$ and $y = p \tan \theta + q \sec \theta$, then prove that $x^2 - y^2 = p^2 - q^2$
- Prove that : $(1 + \tan^2 A) / (1 + \cot^2 A) = \tan^2 A$
- Data of 'missed catches' for the 40 matches played by a player is as follow; :

Number of missed catches in a match	0-3	3-6	6-9	9 - 12	12-15
Number of matches	15	16	3	4	2

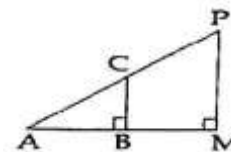
Calculate the mean number of catches missed by him

SECTION-C

- Is product of a rational number and an irrational number, a rational number? Is product of two irrational numbers a rational number or irrational number? Justify giving examples.
- Solve using cross multiplication method: $5x + 4y - 4 = 0$ and $x - 12y - 20 = 0$
- Divide the polynomial $6x^4 - 44x^2 + 6x - 3$ by the polynomial $x^2 - 3x + 1$ and verify the division algorithm.
- Two chairs and three tables cost Rs.5650 whereas three chairs and two tables cost Rs.7100. Find the cost of a chair and a table separately.
- A girl of height 100 cm is walking away from the base of a lamp post at a speed of 1.9 m/s. If the lamp is 5 m above the ground, find the length of her shadow after 4 seconds.

16. $\triangle ABC$ and $\triangle AMP$ are two right angled triangles right angled at B and M respectively.

Prove that $CA \times MP = PA \times BC$.



17. Given $\sin A = \frac{3}{5}$, find the other trigonometric ratios of the angle A

18. Prove that : $(\sin A - 2\sin^3 A) / (2\cos^3 A - \cos A) = \tan A$

19. Calculate the mean for the following frequency distribution:

Class	10-30	30-50	50-70	70-90	90-110
Frequency	15	18	25	10	2

20. The mean weight of 150 students in a class is 60 kg. The mean weight of boys is 70 kg while that of girls is 55 kg. Find the number of boys and girls in the class.

SECTION-D

21. Show that $\sqrt{3}$ is an irrational number.

22. Draw the graph of the following pair of linear equations: $x + 3y = 6$ and $2x - 3y = 12$.

Find the ratio of the areas of the two triangles formed by first line, $x = 0$, $y = 0$ and second line $x = 0$, $y = 0$

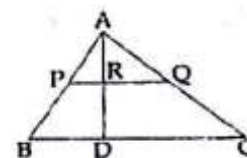
23. Find all other zeroes of the polynomial $x^4 - 2x^3 - 7x^2 + 8x + 12$, if two of its zeroes are -1 and 2

24. While teaching about the Indian National flag, teacher asked the students that how many lines are there in Blue colour wheel. One student replies that it is 8 times the number of colours in the flag. While other says that the sum of the number colours in the flag and number of lines in the wheel of the flag is 27. Convert the statements given by the students into Linear Equation of two variables. Find the number of lines in the wheel. What does the wheel signifies in the flag?

25. In $\triangle ABC$, from A and B altitudes AD and BE are drawn. Prove that $\triangle ADC \sim \triangle BEC$. Is

$\triangle ADB \sim \triangle AEB$ and $\triangle ADB \sim \triangle ADC$?

26. In the given figure, $AP = 3$ cm, $AR = 4.5$ cm, $AQ = 6$ cm, $AB = 5$ cm and $AC = 10$ AD and ratio of areas of $\triangle ARQ$ and $\triangle ADC$.



27. If $\sin(A+B) = \sin A \cdot \cos B + \cos A \cdot \sin B$ and $\cos(A-B) = \cos A \cdot \cos B + \sin A \cdot \sin B$ Find the value of (1) $\sin 75^\circ$ (ii) $\cos 15^\circ$

28. Prove that: $(\tan \theta + \sec \theta - 1)(\tan \theta + 1 + \sec \theta) = \frac{2 \sin \theta}{1 - \sin \theta}$

29. Prove that: $\sqrt{\sec^2 \theta + \operatorname{cosec}^2 \theta} = \tan \theta + \cot \theta$

30. In a village, number of mourners in 50 families are given in the following frequency distribution:

Number of members	1-3	3-5	5-7	7-9	9-11	11-13	13-15	15-17	17-19
Number of families	2	8	6	10	5	5	7	4	3

Find the mode and mean of the above data

31. The following table gives the daily income of 50 workers of a factory. Draw both types ("less than type" and "greater than type") ogive.

Daily income (in Rs.)	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200
Number of workers	12	14	8	6	10