

Mathematics

Summative Assessment - I

(Class - X)**(Set - 6)**

Time allowed: 3 hours

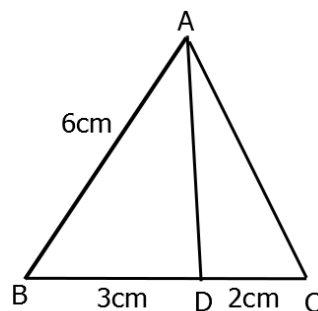
Maximum Marks: 90

General Instructions:

- All questions are compulsory.
- The question paper comprises of 31 questions divided into four sections A, B, C and D. You are to attempt all the four sections.
- Questions 1 to 4 in section A are one mark questions.
- Questions 5 to 10 in section B are two marks questions.
- Questions 11 to 20 in section C are three marks questions.
- Questions 21 to 31 in section D are four marks questions.
- There is no overall choice in the question paper. Use of calculators is not permitted.

SECTION – A

- If the graph of quadratic polynomial $ax^2 + bx + c$ cuts negative direction of y -axis, then what is the sign of c ?
- For what value of k , the following pair of linear equations has infinitely many solutions?
 $10x + 5y - (k - 5) = 0$
 $20x + 10y - k = 0$
- In the given figure, if AD is the bisector of $\angle A$, what is AC ?



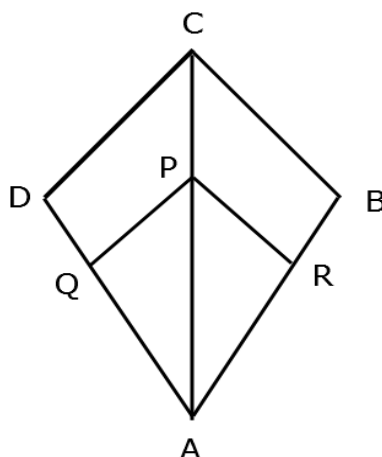
- If $\sin A + \sin^2 A = 1$, then what will be the value of $\cos^2 A + \cos^4 A$?

SECTION - B

- Can $(x - 3)$ be the remainder on division of a polynomial $p(x)$ by $(2x + 3)$? Justify your answer.
- Evaluate $\sin 39^\circ - \cos 51^\circ$.
- Find the value of $\text{HCF} \times \text{LCM}$ for the numbers 80 and 120.
- Find the mode of the following distribution.

Class-interval:	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency:	5	8	7	12	28	20	10	10

- If $\sec 4A = \text{cosec}(A - 20^\circ)$, where $4A$ is an acute angle, find the value of A .
- In the given figure, $PQ \parallel CD$ and $PR \parallel CB$. Prove that $\frac{AQ}{QD} = \frac{AR}{RB}$.



SECTION - C

- Use Euclid's division algorithm to find the HCF of 196 and 38220.
- Prove that $\sqrt{5} + \sqrt{3}$ is irrational.
- If α and β are the zeroes of the polynomial $x^2 - 2x - 15$, then form a quadratic polynomial whose zeroes are 2α and 2β .
- The diagonals of a trapezium ABCD with $AB \parallel DC$ intersect each other at point O. If $AB = 2CD$, find the ratio of the areas of triangles AOB and COD.

15. The perimeters of two similar triangles are 25 cm and 15 cm, respectively. If one side of first triangle is 9 cm, what is the corresponding side of the other triangle/
16. If $\tan \theta = \frac{3}{4}$, find the value of $\frac{1 - \cos \theta}{1 + \cos \theta}$.
17. The arithmetic mean of the following data is 14. Find the value of k .
- | | | | | | |
|------|---|-----|----|----|----|
| $x:$ | 5 | 10 | 15 | 20 | 25 |
| $f:$ | 7 | k | 8 | 4 | 5 |
18. There are two examination rooms A and B. If 10 candidates are sent from A to B, the number of students in each room is same. If 20 candidates are sent from B to A, the number of students in A is double the number of students in B. Find the number of students in each room.
19. A vertical stick of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.
20. Find the mean of the following frequency distribution, using step-division method.

Class:	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency:	7	12	13	10	8

SECTION - D

21. Solve the following system of equations:
 $12y + 30x = 5xy$, $30y + 40x = 9xy$ ($x \neq 0, y \neq 0$)
22. Find the other zeroes of the polynomial $p(x) = 2x^4 + 7x^3 - 19x^2 - 14x + 30$ if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.
23. Check graphically whether the pair of linear equation $4x - y - 8 = 0$ and $2x - 3y + 6 = 0$ is consistent. Also, find the vertices of the triangle formed by these lines with the x-axis.
24. In an isosceles triangle ABC with $AB = AC$ and $BD \perp AC$. Prove that $BD^2 - CD^2 = 2CD \cdot AD$.
25. Prove that in a triangle, if the square of one side is equal to the sum of the squares of the other two sides, then the angles opposite to the first side is a right angle.
26. Prove $\frac{1 + \sec \theta}{\sec \theta} = \frac{\sin^2 \theta}{1 - \cos \theta}$.
27. If $a \cos \theta + b \sin \theta = m$ and $a \sin \theta - b \cos \theta = n$, then prove that $a^2 + b^2 = m^2 + n^2$
28. Evaluate $4(\sin^4 30^\circ + \cos^4 60^\circ) - \frac{2}{3}(\sin^2 60^\circ - \cos^2 45^\circ) + \frac{1}{2} \tan^2 60^\circ$.

29. If mean of the following distribution is 54, find the value of k .

Class:	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency:	7	k	10	9	13

30. Find the mean, median and mode of the following data:

Class:	0 – 50	50 – 100	100 – 150	150 – 200	200 – 250	250 – 300
Frequency:	2	3	5	6	5	3

31. Sonal has some pencils and pens which together are 70 in number. If she gives 5 pencils to her younger sister and 5 pens to her younger brother, then the number of pencils would become double of the number of pens. Find the original number of pens and pencils that Sonal had. Also tell which value of Sonal is depicted in the question?