

COURSE STRUCTURE CLASS -X

Units	Unit Name	Marks
I	NUMBER SYSTEMS	06
II	ALGEBRA	20
III	COORDINATE GEOMETRY	06
IV	GEOMETRY	15
V	TRIGONOMETRY	12
VI	MENSURATION	10
VII	STATISTICS & PROBABILITY	11
	Total	80

UNIT I: NUMBER SYSTEMS

1. REAL NUMBER

(15) Periods

Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}, \sqrt{3}, \sqrt{5}$

UNIT II: ALGEBRA

1. POLYNOMIALS

(8) Periods

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials.

2. PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

(15) Periods

Pair of linear equations in two variables and graphical method of their solution, consistency/inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination. Simple situational problems.

3. QUADRATIC EQUATIONS

(15) Periods

Standard form of a quadratic equation $ax^2 + bx + c = 0$, ($a \neq 0$). Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots.

Situational problems based on quadratic equations related to day to day activities to be incorporated.

4. ARITHMETIC PROGRESSIONS

(10) Periods

Motivation for studying Arithmetic Progression Derivation of the n^{th} term and sum of the first n terms of A.P. and their application in solving daily life problems.

UNIT III: COORDINATE GEOMETRY

Coordinate Geometry

(15) Periods

Review: Concepts of coordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division).

UNIT IV: GEOMETRY

1. TRIANGLES

(15) Periods

Definitions, examples, counter examples of similar triangles.

1. (Prove) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
2. (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
3. (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
4. (Motivate) If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
5. (Motivate) If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

2. CIRCLES

(10) Periods

Tangent to a circle at, point of contact

1. (Prove) The tangent at any point of a circle is perpendicular to the radius through the point of contact.
2. (Prove) The lengths of tangents drawn from an external point to a circle are equal.

UNIT V: TRIGONOMETRY

1. INTRODUCTION TO TRIGONOMETRY (10) Periods

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios whichever are defined at 0° and 90° . Values of the trigonometric ratios of 30° , 45° and 60° . Relationships between the ratios.

2. TRIGONOMETRIC IDENTITIES (15) Periods

Proof and applications of the identity $\sin^2 A + \cos^2 A = 1$. Only simple identities to be given.

3. HEIGHTS AND DISTANCES: Angle of elevation, Angle of Depression. (10)Periods

Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30° , 45° , and 60° .

UNIT VI: MENSURATION

1. AREAS RELATED TO CIRCLES (12) Periods

Area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60° , 90° and 120° only.

2. SURFACE AREAS AND VOLUMES (12) Periods

Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones.

UNIT VII: STATISTICS AND PROBABILITY

1. STATISTICS (18) Periods

Mean, median and mode of grouped data (bimodal situation to be avoided).

2. PROBABILITY (10) Periods

Classical definition of probability. Simple problems on finding the probability of an event.

Disclaimer Dropped Topics

Chapter 1 - Real Numbers

- 1.2 Euclid's division lemma
- 1.5 Revisiting rational numbers and their decimal expansions

Chapter 2 - Polynomials

- 2.4 Division algorithm for polynomials

Chapter 3 - Pair of Linear Equations in Two Variables

- 3.2 Pair of linear equations in two variables
- 3.3 Graphical method of solution of a pair of linear equations
- 3.4.3 Cross-multiplication method
- 3.5 equation reducible to a pair of linear equations in two variables

Chapter 4 - Quadratic Equations

- 4.4 Solution of a quadratic equation by completing the squares

Chapter 6 - Triangles

- 6.5 Areas of similar triangles
- 6.6 Pythagoras theorem

Chapter 7 - Coordinate Geometry

- 7.4 Area of a triangle

Chapter 8 - Introduction to Trigonometry

- 8.4 Trigonometric ratios of complementary angles

Chapter 9 - Some Applications of Trigonometry

- 9.1 Introduction

Chapter 11 - Construction

- 11.1 Introduction
- 11.2 Division of a line segment
- 11.3 Construction of tangents to a circle
- 11.4 Summary

Chapter 12 - Areas Related to Circles

- 12.1 Introduction
- 12.2 Perimeter and area of a circle — A review
- 12.4 Areas of combinations of plane figures

Chapter 13 - Surface Areas and Volumes

13.4 Conversion of solid from one shape to another

13.5 Frustum of a cone

Chapter 14 - Statistics

14.5 Graphical representation of cumulative frequency distribution

Chapter 15 - Probability

15.1 Introduction

Exercise 15.2 (Optional)

