Bhartiya Shiksha Board
Mathematics and Computational Thinking
Syllabus for Class-IX (Academic session-2026-27)
(Subject Code- 032)

Marks Distribution Unit -Wise

S.No.	Unit Name	Marks in Class IX
1.	Number System	12
2.	Algebra	14
3.	Coordinate Geometry	06
4.	Geometry	18
5.	Trigonometry	08
6.	Mensuration	12
7.	Statistics and Probability	10
	Total	**80**

S.No.	Internal Assessment	Marks
01	Application of Mathematics in AI (Computer Lab Activity)	05
02	Mathematical Models, Projects etc.	10
03	Periodic test (average of best two)	05
	Total	**20**

Unit-Wise Chapters in Classes IX

Unit No.	Unit Name	Chapters in Class-IX
01	Number System	Real Number System Ratio and Proportion
02	Algebra	Polynomials and Algebraic Identities Linear Equation in two Variables
03	Coordinate Geometry	Introduction to Coordinate Geometry
04	Geometry	Shulba Sutras and Euclid's Geometry Lines and Angles Triangles and its Properties Quadrilaterals and Area of Parallelograms Constructions
05	Trigonometry	Introduction to Trigonometry
06	Mensuration	Area of Triangles Areas related to circles
07	Statistics and Probability	Statistics Probability
08	Python, AI, Data Science,	Applications of Mathematics in Artificial Intelligence.

Syllabus Class-IX (Mathematics)

Chapter-1 Real Number System (Periods 12)

(Duration of One Period = 50 minutes)

Recalling of natural numbers, integers, rational numbers and their representation on number line. Review of rational numbers as recurring/terminating/ non-terminating decimals. Representation of terminating/non-terminating recurring decimals, on the number line through successive magnification. Examples of nonrecurring/non terminating decimals such as non-rational numbers (irrational numbers) such as $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$ etc., and their representation on the number line. Existence of infinite rational/ irrational numbers between two rational and irrational numbers. Inserting rational/ irrational numbers between two rational and irrational numbers.

Real numbers by explaining that every real number is represented by a unique point on the number line, and conversely, every point on the number line represents a unique real number. Operations on real numbers, properties of real numbers, representation of $\sqrt{x}$ for a given positive real number x (geometric proof only). Definition of n^{th} root of a positive real number.

Recall of laws of exponents with integral powers. Rational exponents with positive real bases (to be done by particular cases, allowing learner to arrive at the general laws). Rationalisation of real numbers (surds) of the type (and their combinations) $\frac{1}{a+b\sqrt{x}}$ and $\frac{1}{\sqrt{x}+\sqrt{y}}$, where x and y are natural numbers and a, b are integers.

Logarithms: Interchanging exponential form into logarithmic form and vice-versa. Laws of logarithms and their use in expansions.

Chapter-2 More on Ratio and Proportion (Periods 10)

Recalls ratio and proportion, continued proportion, mean proportion, componendo, dividendo, alternendo, invertendo properties and their combinations. Direct simple applications on proportion only.

Chapter-3 Polynomials and Algebraic Identities (Periods 12)

Recalling polynomials. Definition of a polynomial in one variable, its coefficients, with examples and counter examples, its terms, zero polynomial. Degree of a polynomial. Constant, linear, quadratic, cubic polynomials; monomials, binomials, trinomials. Factors and multiples. Zeros/roots of a polynomial. Statement of the Remainder Theorem with examples and analogy to integers. Statement and proof of the Factor Theorem with visualisation and division algorithm. Factorisation of $ax^2 + bx + c$, $a \neq 0$, where a, b, c are real numbers, and of cubic polynomials using the Factor Theorem.

Recall of algebraic expressions and identities. Further identities of the type:
$(x \pm y)^3 = x^3 \pm y^3 \pm 3xy\,(x \pm y)$, $x^3 \pm y^3 = (x \pm y)(x^2 \mp xy + y^2)$
$x^3 + y^3 + z^3 - 3xyz = (x + y + z)\,(x^2 + y^2 + z^2 - xy - yz - zx)$ and their use in factorization of polynomials. Geometric proofs for algebraic identities and other proofs without words. Discovers and proves algebraic identities and models real-life situations and solve them.

Chapter-4 Introduction to Coordinate Geometry (Periods 10)

Recalling the Cartesian plane: Names, terms, and notations of the coordinate plane, Coordinates of a point and their location, Plotting points in the Cartesian plane. Distance Between Two Points: Distance by observation on the graph, using the Pythagorean theorem and distance formula. Plotting Graphs**:** Dependent and independent variables, Graphing of the relations: $ax + by + c = 0$ in different forms and linking them to the chapter on equations in two variables. Case Studies and Applications: Solving real-life problems using Cartesian plane concepts and distance formula.

Chapter-5 Linear Equations in Two Variables (Periods 10)

Recall of linear equations in one variable. Introduction to the equation in two variables. Prove that a linear equation in two variables has infinitely many solutions, and justify their being written as ordered pairs of real numbers, plotting them and showing that they seem to lie on a line. Examples, problems from real life, including contextualised problems on world scenario and with algebraic and Graphical solutions being done simultaneously.

Chapter-6 Shulba Sutras and Euclid's Geometry (Periods 06)

History of Euclid's *Elements,* geometry in Shulba Sutras. Euclid's method of formalizing observed phenomenon into rigorous mathematics with definitions, common/obvious notions, axioms/postulates, and theorems. The five postulates of Euclid. Equivalent versions of the fifth postulate. Showing the relationship between axiom and theorem. Theorems using Euclid's axioms and postulates for triangles and quadrilaterals, and their application to solve geometric problems such as, to prove

1. Given two distinct points, there exists one and only one line through them.
2. Two distinct lines cannot have more than one point in common.

Chapter-7 Lines and Angles (Periods 12)

Recall lines and angles and its related terms and prove:

1. If a ray stands on a line, then the sum of the two adjacent angles so formed is 180° and the converse.

2. If two lines intersect, the vertically opposite angles are equal.
3. Results on corresponding angles, alternate angles, interior angles when a transversal intersects two parallel lines.
4. Lines, which are parallel to a given line, are parallel.
5. The sum of the angles of a triangle is 180°.
6. If a side of a triangle is produced, the exterior angle so formed is equal to the sum of the two interior opposite angles. Questions related to above theorems.

Chapter-8 Triangles

(Periods 12)

Recall congruent triangles and terms related to it and prove:
1. Two triangles are congruent if any two sides and the included angle of one triangle is equal to any two sides and the included angle of the other triangle (SAS Congruence).
2. Two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle (ASA Congruence).
3. Two triangles are congruent if the three sides of one triangle are equal to three sides of the other triangle (SSS Congruence).
4. Two right triangles are congruent if the hypotenuse and a side of one triangle are equal (respectively) to the hypotenuse and a side of the other triangle.
Review properties of triangles
5. The angles opposite to equal sides of a triangle are equal.
6. The sides opposite to equal angles of a triangle are equal.
7. Each angle of an equilateral triangle is 60^0.
8. Triangle inequalities and relation between 'angle and facing side'; inequalities in a triangle.
Questions related to above theorems.

Chapter-9 Quadrilaterals and Areas of Parallelograms (Periods 12)

Recalls various types of quadrilaterals and prove:
1. (Prove) The diagonal divides a parallelogram into two congruent triangles.
2. In a parallelogram opposite sides are equal and conversely.
3. In a parallelogram opposite angles are equal and conversely.
4. A quadrilateral is a parallelogram if a pair of its opposite sides is parallel and equal.
5. In a parallelogram, the diagonals bisect each other and conversely.
6. In a triangle, the line segment joining the mid points of any two sides is parallel to the third side and its converse.
Recalls area of different quadrilaterals and prove:
1. Parallelograms on the same base and between the same parallels have the same area.
2. Triangles on the same base and between the same parallels are equal in area and its converse.

Chapter-10 Constructions (Periods 06)

Recalls construction of bisectors of a line segment, angles 60°, 90°, 45°, equilateral triangles etc, and Using ruler and compasses, draw/ construct:
1. Orthocentre and centroid of a triangle.
2. A triangle given its base, sum/difference of the other two sides and one base angle.
3. A triangle of given perimeter and base angles.

Chapter-11 Introduction to Trigonometry (Periods 12)

Trigonometric ratios of an acute angle of a right-angled triangle, whichever are defined at 0° and 90°. Definitions of the basic trigonometric functions, their history and motivation (including the introduction of the sin and cos functions by Aryabhata using chords), and their utility across the sciences. Values of the trigonometric ratios of angles 0^0, 30°, 45°, 60°and 90° (with proofs). Relationships between the complementary trigonometric ratios with application. Finding sides of a right triangles by using trigonometric ratios. ($0^0 \leq A \leq 90^0$)

Chapter-12 Areas of Triangles (Periods 08)

Recalls area of triangle. Visualises, represents, and calculates the area of a triangle using Heron's formula and its generalisation to cyclic quadrilaterals given by Brahmagupta's formula and its application in finding the area of a quadrilateral.

Chapter-13 Areas Related to Circles (Periods 10)

Recall the area of a circle. Irrationality of π, the best approximations to π discovered over human history, and the first exact formula (infinite series) for π given by Madhava. 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. Plane figures involving triangles, simple quadrilaterals and circle should be taken.

Chapter-14 Statistics (Periods 10)

Introduction to Statistics: Collection of data, presentation of data – tabular form, ungrouped/ grouped. Measures of central tendencies and standard deviation of ungrouped data and their importance. Bar graphs, histograms (with varying base lengths), qualitative analysis of data to choose the correct form of presentation for the collected data.

Chapter-15 Probability (Periods 10)

History, Repeated experiments and observed frequency approach to probability. Empirical probability. (A large amount of time to be devoted to group and to individual activities to motivate the concept; the experiments to be drawn from real-life situations, and from examples used in the chapter on statistics). Problems on the likelihood of everyday events.

Chapter-16 Applications of Mathematics in Artificial Intelligence (Periods 10)

Introduction to Python Programming, Python Fundamentals, Control Structures, Functions in Python, Python's Role in AI and Data Science, Python Ecosystem for AI & DS, Solving Problems with Python, Data Handling and Visualization with Python, Exploratory Data Analysis, Data Visualization Techniques, Mathematical Applications of Python in Coordinate Geometry, Algebra and Polynomials, Trigonometry in Python, Python-Based Statistics and Probability
(For internal assessment only)