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CBSE Syllabus Class 9 Maths

COURSE STRUCTURE CLASS –IX

Units	Unit Name	Marks
I	NUMBER SYSTEMS	08
II	ALGEBRA	17
III	COORDINATE GEOMETRY	04
IV	GEOMETRY	28
V	MENSURATION	13
VI	STATISTICS & PROBABILITY	10
	Total	80

UNIT I: NUMBER SYSTEMS

1. REAL NUMBERS (10 Periods)

1. Review of representation of natural numbers, integers, rational numbers on the number line. Rational numbers as recurring/ terminating decimals. Operations on real numbers.
2. Examples of non-recurring/non-terminating decimals. Existence of non-rational numbers (irrational numbers) such as $\sqrt{7}$, $\sqrt{3}$ and their representation on the number line.
3. Rationalization (with precise meaning) of real numbers of the type $\frac{1}{a+b\sqrt{x}}$ and $\frac{1}{\sqrt{x}+\sqrt{y}}$ (and their combinations) where x and y are natural number and a and b are integers.
4. 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.)

UNIT II: ALGEBRA

1. POLYNOMIALS (15) Periods

Definition of a polynomial in one variable, with examples and counter examples. Coefficients of a polynomial, terms of a polynomial and zero polynomial. Degree of a polynomial. Constant, linear, quadratic and cubic polynomials. Monomials, binomials, trinomials. Factors and multiples. Zeros of a polynomial. Factorization of $ax^2 + bx + c$, $a \neq 0$ where a, b and c are real numbers, and of cubic polynomials using the Factor Theorem.

Recall of algebraic expressions and identities. Verification of identities:

$(x \pm y \pm z)^2 = x^2 + y^2 + z^2 \pm 2xy \pm 2yz \pm 2zx$

$(x \pm y)^3 = x^3 \pm y^3 \pm 3xy\,(x \pm y)$

$x^3 \pm y^3 = (x \pm y)\,(x^2 \mp xy + y^2)$

and their use in factorization of polynomials.

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2. LINEAR EQUATIONS IN TWO VARIABLES (10) Periods

Recall of linear equations in one variable. Introduction to the equation in two variables. Focus on linear equations of the type ax+by+c=0. Explain 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 lie on a line. Graph of linear equations in two variables. Examples, problems from real life with algebraic and graphical solutions being done simultaneously.

UNIT III: COORDINATE GEOMETRY

COORDINATE GEOMETRY (6) Periods

The Cartesian plane, coordinates of a point, names and terms associated with the coordinate plane, notations, plotting points in the plane.

UNIT IV: GEOMETRY

1. LINES AND ANGLES (13) Periods

1. (Motivate) If a ray stands on a line, then the sum of the two adjacent angles so formed is 180^{O} and the converse.
2. (Prove) If two lines intersect, vertically opposite angles are equal.
3. (Motivate) Results on corresponding angles, alternate angles, interior angles when a transversal intersects two parallel lines.
4. (Motivate) Lines which are parallel to a given line are parallel.
5. (Prove) The sum of the angles of a triangle is 180^{O}.
6. (Motivate) If a side of a triangle is produced, the exterior angle so formed is equal to the sum of the two interior opposite angles.

2. TRIANGLES (15) Periods

1. (Motivate) 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. (Motivate) Two triangles are congruent if the three sides of one triangle are equal to three sides of the other triangle (SSS Congruence).

3. (Motivate) 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. (RHS Congruence)

4. (Prove) The angles opposite to equal sides of a triangle are equal.

5. (Motivate) The sides opposite to equal angles of a triangle are equal.

4. QUADRILATERALS (10) Periods

1. (Prove) The diagonal divides a parallelogram into two congruent triangles.

2. (Motivate) In a parallelogram opposite sides are equal, and conversely.

3. (Motivate) In a parallelogram opposite angles are equal, and conversely.

4. (Motivate) A quadrilateral is a parallelogram if a pair of its opposite sides is parallel and equal.

5. (Motivate) In a parallelogram, the diagonals bisect each other and conversely.

6. (Motivate) In a triangle, the line segment joining the mid points of any two sides is parallel to the third side and in half of it and (motivate) its converse.

5. CIRCLES (12) Periods

Through examples, arrive at definition of circle and related concepts-radius, circumference, diameter, chord, arc, secant, sector, segment, subtended angle.

1. (Prove) Equal chords of a circle subtend equal angles at the center and (motivate) its converse.
2. (Motivate) The perpendicular from the center of a circle to a chord bisects the chord and conversely, the line drawn through the center of a circle to bisect a chord is perpendicular to the chord.
3. (Motivate) Equal chords of a circle (or of congruent circles) are equidistant from the center (or their respective centers) and conversely.
4. (Prove) The angle subtended by an arc at the center is double the angle subtended by it at any point on the remaining part of the circle.
5. (Motivate) Angles in the same segment of a circle are equal.

6. (Motivate) The sum of either of the pair of the opposite angles of a cyclic quadrilateral is 180° and its converse.

6. CONSTRUCTIONS (5) Periods

1. Construction of bisectors of line segments and angles of measure 60°, 90°, 45° etc., equilateral triangles.
2. Construction of a triangle given its base, sum/difference of the other two sides and one base angle.

UNIT V: MENSURATION

1. AREAS (2) Periods

Area of a triangle using Heron's formula (without proof)

2. SURFACE AREAS AND VOLUMES (12) Periods

Surface areas and volumes of cubes, cuboids, spheres (including hemispheres) and right circular cylinders/cones.

UNIT VI: STATISTICS & PROBABILITY

1. STATISTICS (6) Periods

Introduction to Statistics: Collection of data, presentation of data — tabular form, ungrouped / grouped, bar graphs

2. PROBABILITY (9) Periods

History, Repeated experiments and observed frequency approach to probability.
Focus is on empirical probability. (A large amount of time to be devoted to groupand 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).