

Math's CLASS 10 SYLLABUS 2013-2014

The Syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of the society. The present revised syllabus has been designed in accordance with National Curriculum Framework 2005 and as per guidelines given in Focus Group on Teaching of Mathematics which is to meet the emerging needs of all categories of students. Motivating the topics from real life problems and other subject areas, greater emphasis has been laid on applications of various concepts.

The curriculum at Secondary stage primarily aims at enhancing the capacity of students to employ Mathematics in solving day-to-day life problems and studying the subject as a separate discipline. It is expected that students should acquire the ability to solve problems using algebraic methods and apply the knowledge of simple trigonometry to solve problems of heights and distances. Carrying out experiments with numbers and forms of geometry, framing hypothesis and verifying these with further observations form inherent part of Mathematics learning at this stage. The proposed curriculum includes the study of number system, algebra, geometry, trigonometry, mensuration, statistics, and graphs and coordinate geometry etc.

The teaching of Mathematics should be imparted through activities which may involve the use of concrete materials, models, patterns, charts, pictures posters, games, puzzles and experiments.

General Instructions:

1. The units specified for each term shall be assessed through both Formative and Summative assessments.
2. In each term, there will be two formative assessments each carrying 10% weightage.
3. The summative assessment in each term will carry 30% weightage.
4. One Formative assessment carrying 10% weightage in each term would be based completely on hands on practicals.

COURSE STRUCTURE

CLASS IX First Term

Marks: 90

<u>Units</u>	<u>Marks</u>
I. Number system	11
II. Algebra	23
III. Geometry	17
IV. Trigonometry	22
VII. Statistics	17
Total	90

UNIT I : NUMBER SYSTEMS

1. REAL NUMBERS

(15) Periods

Euclid's division lemma, Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples,

Proofs of results - irrationality of $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$, decimal expansions of rational numbers in terms of terminating/non-terminating recurring decimals.

UNIT II: ALGEBRA

1. POLYNOMIALS

(7) Periods

Zeros of a polynomial. Relationship between zeros and coefficients of a polynomial with particular reference to quadratic polynomials. Statement and simple problems on division algorithm for polynomials with real coefficients.

2. PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

(15) Periods

Pair of linear equations in two variables. Geometric representation of different possibilities of solutions/ inconsistency.

Algebraic conditions for number of solutions. Solution of pair of linear equations in two variables algebraically by substitution, by elimination and by cross multiplication. Simple situational problems must be included. Simple problems on equations reducible to linear equations may be included.

UNIT III: 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.
6. (Motivate) if a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse; the triangles on each side of the perpendicular are similar to the whole triangle and to each other.
7. (Prove) The ratio of the areas of two similar triangles is equal to the ratio of the squares on their corresponding sides.
8. (Prove) in a right triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.
9. (Prove) in a triangle, if the square on one side is equal to sum of the squares on the other two sides, the angles opposite to the first side is a right triangle.

UNIT IV: TRIGONOMETRY

1. TRIGONOMETRIC RATIOS

(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° & 90° . Values (with proofs) of the trigonometric ratios of 30° , 45° & 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. Trigonometric ratios of complementary angles.

UNIT VII: STATISTICS AND PROBABILITY

1. STATISTICS

(18) Periods

Mean median and mode of grouped data (bimodal situation to be avoided). Cumulative frequency graph

COURSE STRUCTURE

CLASS X Second Term

Marks : 90

<u>Units</u>	<u>Marks</u>
II. Algebra	23
III. Geometry	17
IV. Trigonometry	08
V. Probability	08
VI. Coordinate Geometry	11
VII Mensuration	23
Total	90

UNIT II : ALGEBRA

3. QUADRATIC EQUATIONS

(15) Periods

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

Problems related to day to day activities to be incorporated.

4. ARITHMETIC PROGRESSIONS

(8) Periods

Motivation for studying AP. Derivation of standard results of finding the n^{th} term and sum of first n terms.

UNIT III : GEOMETRY

2. CIRCLES**(8) Periods**

Tangents to a circle motivated by chords drawn from points coming closer and closer and closer to the point.

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 circle are equal.

3. CONSTRUCTIONS**(8) Periods**

1. Division of a line segment in a given ratio (internally)
2. Tangent to a circle from a point outside it.
3. Construction of a triangle similar to a given triangle.

UNIT IV : Trigonometry**3. HEIGHTS AND DISTANCES****(8) Periods**

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

UNIT V : PROBABILITY**PROBABILITY****(10) Periods**

Classical definition of probability. Connection with probability as given in Class IX. Simple problems on single events, not using set notation.

UNIT VI : COORDINATE GEOMETRY**1. LINES (In two-dimensions)****(14) Periods**

Review the concepts of coordinate geometry done earlier including graphs of linear equations. Awareness of geometrical representation of quadratic polynomials. Distance between two points and section formula (internal). Area of a triangle.

UNIT VII : MENSURATION**1. AREAS OF PLANE FIGURES****(12) Periods**

Motivate the area of a circle; 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° & 120° only. Plane figures involving triangles, simple quadrilaterals and circle should be taken.)

2. SURFACE AREAS AND VOLUMES**(12) Periods**

(i) Problems on finding surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones. Frustum of a cone.

(ii) Problems involving converting one type of metallic solid into another and other mixed problems. (Problems with combination of not more than two different solids be taken.)

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