

West Bengal Board Math Syllabus for Class 10

Class 10 Math Syllabus

ALGEBRA

1.) Linear Equation of two variables.

* Problem sums in two variable equations (Answers are integers only. Problems to see that used in daily life to be taken).

2.) Polynomials

* H.C.F & L.C.M.

* Rational Expressions

* Meaning, Simplification using factorization and Basic properties of rational expression.
(Commutative, associative and distributive properties are not need. To see that factor theorem is used.)

3.) Quadratic Equation

* Standard form of quadratic equation.

* To solve quadratic equation using, factorization.

* Problem sums from different areas using quadratic equation. (Application).
(it is necessary that roots of quadratic equation should be real.)

4.) Arithmetic progressions.

* Introduction of Arithmetic progression as a progression of numbers.

* Formula of additions.

* Simple problem sums.
(Proof of formula of addition should not be given. In problem sums common difference should not be irrational numbers.)

ARITHMETIC

5.) Installments

* Installments - Buying (Purchase) scheme. (Installments not more than 12).
(in payment of installments amount of installments should be equal.)

6.) Income Tax

* Sums based on Income Tax. (income tax on the salary of salaried persons).

GEOMETRY

7.) Similar Triangles

* Introduction

* Similar Triangles

* Congruent Triangles & Similar Triangles.

* Results of proportionality.

* Fundamental theorem of proportionality (Without proof).

* Theorem:-

A line drawn parallel to a side of a triangle to intersect the other two sides in two distinct points, cuts two. line segment from each of these two sides. Then the line segments lying in the same closed half plan of that line are proportional to the corresponding sides of the triangle (with proof).

* Corollary AD the bisector of Δ of ΔBC meets BC in D. Then $AB \div BD = AC \div DC$ (without proof).

* Theorem:- A Line intersecting two sides of a triangle in two distinct points in such a way that the line segments cut by it on the two sides lying in the same enclosed half plane are proportional to the corresponding sides then the line is parallel to the third side (without proof).

* Numerical based on similarity and geometrical problems.

8.) Conditions & Similarity

* Introduction

* Theorem on similar triangles.

* Theorem (AAA thm). If for any correspondence between two triangles the corresponding angles are congruent, then the correspondence is a similarity (without proof).

* Corollary: (AA) If for a correspondence between two triangles, two pairs of corresponding angles are congruent the correspondence is a similarity.

* Theorem (SAS) If for a correspondence between two triangles, two pair of corresponding sides are proportional and the included angles are congruent, then the correspondence is a similarity.

* Theorem (SAS) For a given correspondence of two triangles if the corresponding sides are in proportion then also the correspondence is a similarity and Similarity and area. (Without proof.)

9.) Similarity and Pythagoras theorem

* Introductions

* Right angled triangle and similarity.

* Theorem : If an altitude is drawn on the hypotenuse of a right angled triangle, then the two triangles so formed are similar to each other and each such triangle is similar to the original triangle. (with proof).

* Adjacent line-segment (Definition).

* Theorem: If an altitude is drawn on the hypotenuse of a right angled triangle then (1) the length of the altitude is the geometric mean of the lengths of the two line segments made by the altitude on the hypotenuse. (2) the length of each side is the geometric mean of the length of line segment of the hypotenuse adjacent to that side. (without proof).

Pythagoras Theorem (with proof) In a right angled triangle the square of the length of the hypotenuse is equal to the sum of the squares of the length of the remaining sides.

Converse of Pythagoras Theorem (with proof). If in a $\triangle ABC$; $AC^2 = AB^2 + BC^2$, then $\angle B$ is a right angle.

* Explanation of Apollonius Theorem.

* Sum based on conditions of similarity and Pythagoras theorem.

10.) Circle and Chord

* Some definitions:- Circle, Radius, Chord, Diameter, Congruent circles, Concentric Circles, secant etc.

* Separation of the plane of circle by the circle.

* Intercal and Extrical of the circle.

* A few theorems on circles.

* Theorem : - A perpendicular drawn through the centre of a circle on a chord bisects the chord (without proof).

* Theorem: - In a circle the line segment joining the mid point of a chord (which is not a diameter) to the centre of the circle is perpendicular to the chord (without proof).

* Result 1 (without proof) Prove that the perpendicular bisector of a chord of a circle lying in the plane of the circle passes through the centre of the circle.

Result 2 (without proof) Prove that three distinct collinear points cannot be the points on the same circle.

* Theorem:- One and only one circle passes through three non-collinear points.

* Theorems on chords.

* Theorem (without proof):- in the same circle (or in congruent circles) congruent chords are equidistant from the centre of the circle.

* Theorem (without proof): - In the same circle (or congruent circles) congruent chords are equidistant from the centre are congruent.

11.) ARC OF A CIRCLE

* Arc of circle and its length.

* Definition:- Arc, Minor Arc, Major arc, semi circular arc.

* Angle subtended by the minor arc at the centre.

* Congruent arcs.

* Theorems on congruent arcs.

- * Theorems:- (without proof) The angles subtended by two congruent minor arcs at the centre are congruent.
- * (Without proof) Minor arcs of the same circle, subtending congruent angles at the centre are congruent.
- * If two arcs of the same circle are congruent then the chords of the circle corresponding to them are also congruent.
- * If two chords of a circle are congruent then minor arcs of the semi-circles corresponding to them are also congruent.
- * Angle subtended by an arc of a circle at a point of a circle.
- * The measure of the angle subtended by an arc of a circle at the centre is twice the measure of the angle subtended by that arc at any point on the remaining part of the circle. Prove that angle inscribed in a semi circle is a right angle.
- * If an angle inscribed in any arc of a circle is a right angle then that arc is a semi circle.
- Definitions:- Segment of a circle, minor segment, major segment, semi circular segment.
- * Explanation of angle in a segment of a circle.
- * Theorems (without proof) If an line segment joining the points, subtend congruent angles at two distinct points lying in the same half plane of the line containing this line segment then all these form arc on the same segment of circle.
- * Sums based on arc of a circle and geometric problem sums.

12.) CIRCLE AND ITS TANGENT

- * Tangent of a circle.
- * Definition of a tangent.
- * Theorem (without proof) - A tangent of a circle is perpendicular to the radius drawn through the point of contact.
- * Theorem (Without proof) - If two tangents of a circle drawn from P a point in the exterior of the circle touch the circle at the points a and B then $PA = PB$
- * Angles made by a chord with a tangent and in the alternate segment.
- * The measure of an angle made by a chord of a circle with the tangent touching the circle at one of the end points of the chord is equal to the measure of an angle made by the chord in the alternate segment.
- * Theorem : (with proof) A line passing through one of the end points of a chord of a circle is so drawn in the plane of the circle that the measure of the angle made by the chord in the alternate segment then the line is a tangent of the circle.
- * Theorem: (with proof) If the tangent PT at a point T of a circle and a secant AB of the circle passing through points A and B of the circle, intersect each other at a point P in the exterior of the circle then $AP.PB = PT^2$
- * Two circles touching each other,.
- Theorem(with proof) The common point of contact of two circles touching each other is on the line joining the centres of circles.
- * Distance between centres of the circle touching each other. Cyclic quadrilateral and its theorems
- * Definition of cyclic quadrilateral
- * Theorem(with proof) The opposite angles of a cyclic quadrilateral are supplementary.
- * Theorem (without proof) A quadrilateral whose opposite angles are supplementary is a cyclic quadrilateral.
- * Sums and geometric problem sums.