

Syllabus for Mid Term Examination(2020-21)

Class-IX

Subject: Mathematics

Chapter 1 : Real Numbers

Review of representation of natural numbers, integers and rational numbers on the number line. Rational numbers as recurring/ terminating decimals. Operations on real numbers.

Examples of non-recurring/non-terminating decimals. Existence of non-rational numbers (irrational numbers) such as $\sqrt{2}$, $\sqrt{3}$ and their representation on the number line.

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.

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.)

Chapter 2 : Polynomials

Definition of a polynomial in one variable with examples and counter examples. Coefficients of a polynomial, terms of a polynomial and zeroes of polynomial. Degree of a polynomial. Constant, linear, quadratic and cubic polynomials. Monomials, binomials, trinomials. Factors and multiples. Zeroes 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:

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

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

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

and their use in factorization of polynomials.

Chapter 3: Coordinate Geometry

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

Chapter 6: Lines and Angles

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

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.

Chapter 11: Constructions

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

Chapter 13: Surface Areas and Volumes

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

Chapter 15: Probability

History, repeated experiments and observed frequency approach to probability. Focus is on 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)