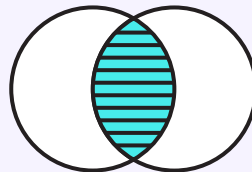
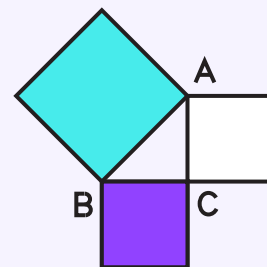
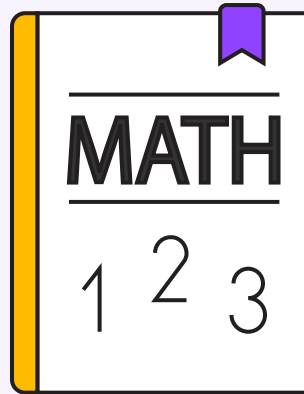
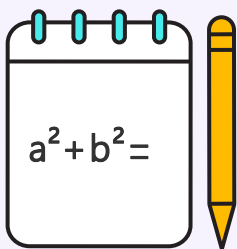
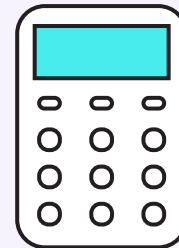
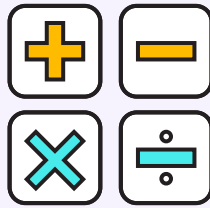
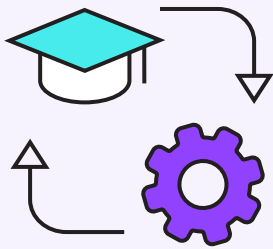


Grade 10

Math Excellence Program



Grade 10

Real Numbers: 10- 12 Classes

Students review real numbers and prime factorization. They learn the **Fundamental Theorem of Arithmetic** and solve problems on **HCF and LCM**. Students review **irrational** and **rational** numbers, their decimal expansions, and properties. They learn **proofs of irrationality**.



Proportions

$$\frac{4}{3} = \frac{16}{12}$$

$$4 \times 12 = 3 \times 16$$

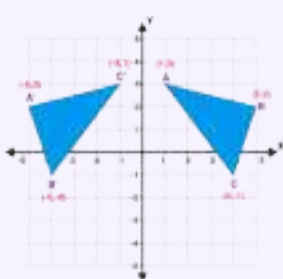
$$48 = 48$$

Proportion: 5-8 Classes

Students learn about **proportion, continued proportion and mean proportion**, and solve word problems on them. Students also learn the **properties of proportion** such as componendo, dividendo, alternendo, invertendo properties and their combinations.

Commercial Mathematics: 10-15 Classes

Students learn about **Sales Tax** and how to **compute** sales tax. They solve word problems on sales tax involving overhead charges, discounts, profit, loss, cost price, Service Tax (SGST) and Central Goods and Service Tax (CGST). Students gain knowledge about **banking**, and learn about **Savings and Recurring Deposit Accounts**. They learn how to calculate **interest** and find **amounts** using the formulae for simple and compound interest.



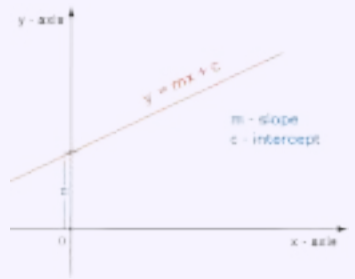
Coordinate Geometry - Reflection: 2-4 Classes

Students learn the **reflection of a point in a line**, reflection of a point in the origin, and **invariant points**.

Grade 10

Coordinate Geometry - Equations of a line: 10-15 Classes

Students understand what is meant by the **slope/gradient** of a line. They learn how to find the slope of a graph. Students learn about the **slope intercept** form, **point-slope** form and **standard form** of the equation of a line. They explore the conditions for two lines to be parallel or perpendicular. They learn the **distance, section and midpoint formulae** and solve problems based on these.



Algebra - Single-Variable Linear Inequalities: 5-7 Classes



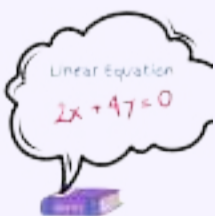
Students learn linear inequations in one unknown for $x \in \mathbb{N}, \mathbb{W}, \mathbb{Z}, \mathbb{R}$. They **solve** linear inequations algebraically and write the solution in **set notation form**. They represent linear inequalities on the **number line**.

Algebra - Matrices: 5-7 Classes

Students learn all about matrices : **what are matrices**, the different types of matrices, **matrix vocabulary**. Students perform operations involving matrices, and use these operations for **proving** results on matrices.



Algebra - Pair Of Linear Equations In 2 Variables: 5-8 Classes



Students explore a pair of linear equations in 2 variables. They learn to frame pairs of equations from given word problems and solve these equations using the methods of : **graphing, substitution, and elimination**.

Algebra - Arithmetic Progressions: 4-7 Classes

Students are introduced to the concept of **number sequences**. They learn about one of the important number sequences : Arithmetic Progressions. Students learn how to find **the general term** in an arithmetic progression, and how to calculate the **sum of an arithmetic progression**. Students learn about the **applications of arithmetic progressions** to real world scenarios.

Arithmetic Progressions

$$a, a+d, a+2d, a+3d, \dots$$

The n^{th} term, $a_n = a+(n-1)d$
Sum of first n terms,
$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{n}{2} [a + l]$$

Grade 10

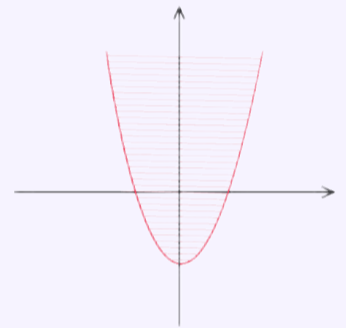
Algebra - Polynomials: 5-8 Classes



Students learn the characteristics of polynomials. They understand the geometrical meaning of the **zeroes of a polynomial**. They understand the **relationship between zeroes and coefficients** of a quadratic polynomial. They learn how to factorize polynomials using the **Factor and Remainder Theorems**.

Algebra - Quadratic Equations: 6-10 Classes

Students explore quadratic equations and solve them by using various methods, such as **factoring, completing the square, and the quadratic formula**. Students learn how to find the **nature of the roots** of a quadratic equation. They solve simple quadratic equation word problems.



Geometry - Similarity: 9-12 Classes

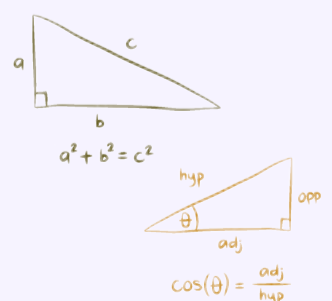
Similarity



Students learn the definition of similarity of figures. They understand the conditions that need to apply for 2 figures to be called similar. Students learn how to **find side lengths and angle measures** in similar figures. They understand the similarity of triangles and the **criterion for similarity of 2 triangles**. They study the **Basic Proportionality theorem**. Students learn the relationship between **areas of similar triangles**. They also learn how to **prove similarity of triangles** using the information given.

Geometry - Pythagorean Theorem And Trigonometry: 10-12 Classes

Students review and **prove the Pythagoras theorem**. They are introduced to trigonometry with the definition of the **trigonometric ratios**. Students derive the basic trigonometric **identities**, and learn how to **prove results** based on these identities. Students learn the values of the trigonometric ratios of the standard angles from 0 to 90 degrees. They apply trigonometry practically in the computation of **heights and distances**.



Grade 10

Geometry - Circle and Areas related to Circle: 8-12 Classes

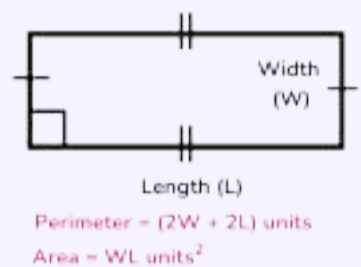


Students learn about **tangents, chords and secants**. They apply the formulas for **finding arc length and sector area**. Students learn about **central and inscribed angles and circles** and how to find their measures. They understand cyclic quadrilaterals, and learn how to construct **tangents** to a circle.

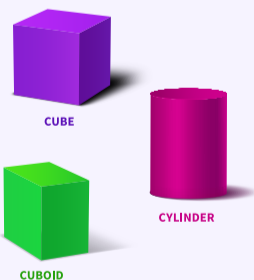
Geometry - Area And Perimeter: 8-10 Classes

Students study various shapes, such as **triangles, squares, rectangles, trapezoids, parallelograms, circles, and polygons**, and learn how to calculate their **area and perimeter**. Students learn how to apply their knowledge of area and perimeter to **real-world problems**, such as calculating the **area of a room** to determine how much paint or carpet is needed, or determining the perimeter of a field for fencing or landscaping purposes. Finding area of **compound figures** is also understood. Students learn about finding area of triangles using **Heron's formula**.

Rectangle Area and Perimeter



Mensuration - Surface Area And Volume: 6-8 Classes



Students learn how to find the **surface area and volume** of solids such as **cylinders, pyramids, cones and spheres**, and **compound figures** that may be formed by combinations of these solids.

Probability: 5-8 Classes

Students learn the concepts of **theoretical probability and experimental probability**, and how to find the probability of different kinds of events such as **compound events, dependent and independent events**. They solve simple **word problems** on single events.



Grade 10

Statistics: 8-12 Classes

Students find **mean, median and mode** of raw and arrayed data and **grouped data** using different methods. They learn graphical representation of data through **histograms and ogive curves**. They find the mode from the histogram, the upper quartile, lower Quartile and median from the ogive. They calculate the **inter quartile range**.



Logic: 4-6 Classes

Students learn how to **reason** for identifying hypotheses and making conclusions. They construct **truth tables** and use them for reasoning. Students learn how to apply **conditionals** for logical conclusions.

Negation
Truth Table

P	~P
T	F
F	T

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