PURPLE TUTOR

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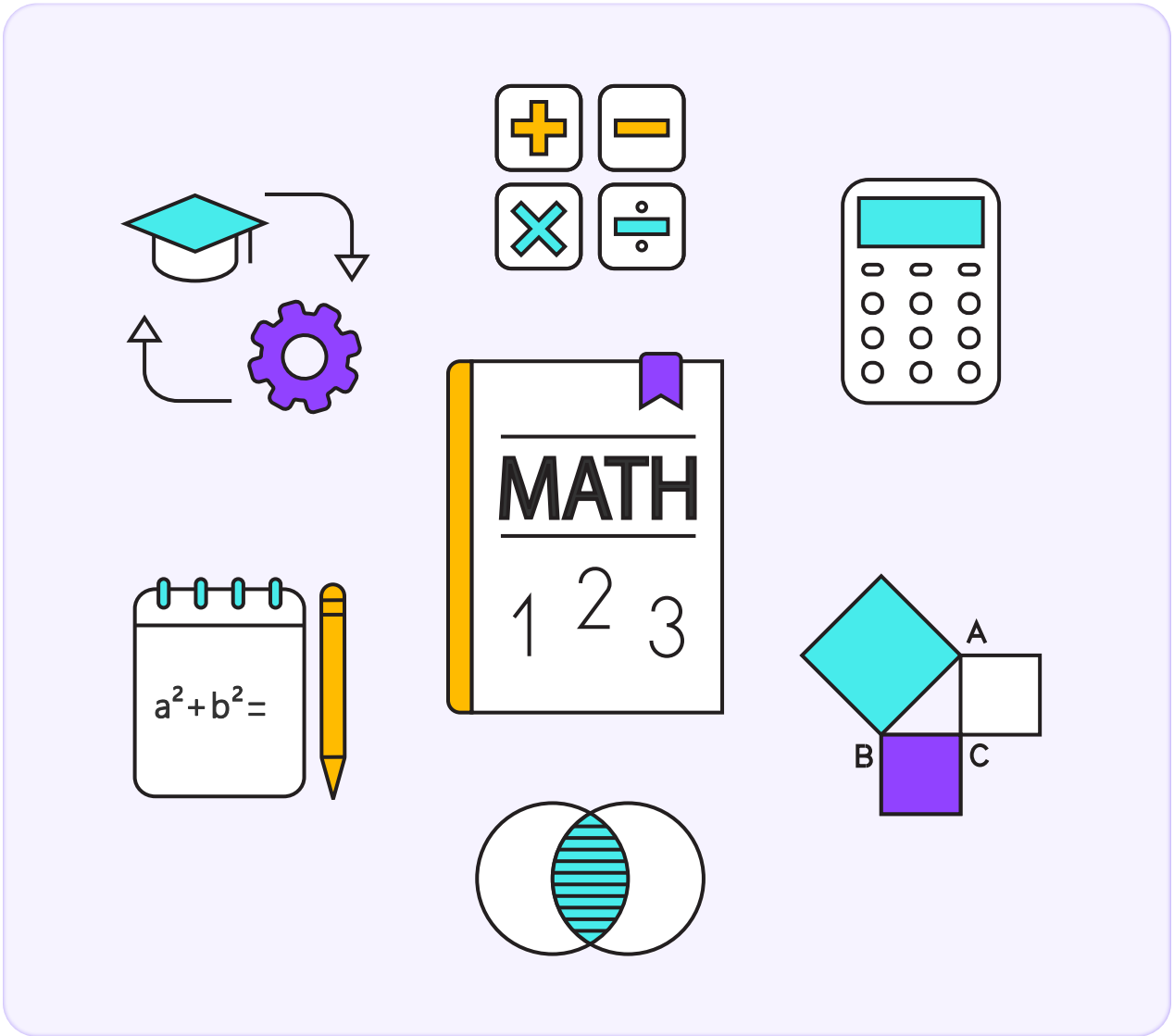
Grade 9

Math Excellence Program

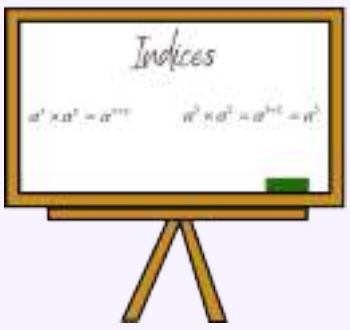


Grade 9

Real Numbers: 10- 15 Classes

Students **represent rational numbers** on the **number line**, evaluate expressions involving them and learn how to identify them by their decimal expansions - **terminating, and non terminating** recurring. Students are **introduced to irrational numbers,** and learn how to identify them by their decimal expansions - **non terminating and non-recurring**. They represent **irrational numbers on the number line** using Pythogoras Theorem. Students also learn how to simplify expressions involving irrational numbers by **rationalizing the denominator.** Students **prove** that √2, √3, √5 are irrational.

Indices/ Exponents: 8-12 Classes



Students explore **indices** and solve equations with variable indices. They evaluate indices which are powers of ten, **indices with decimal and fractional bases,** and **negative indices.** Students perform the operations of **multiplication and division with indices**, according to the **power rule**. They learn how to evaluate expressions using **properties of indices**, and identify equivalent expressions involving indices.

Commercial Mathematics: 2-5 Classes

Students learn about **compound interest** as a repeated simple interest computation with a growing principal. They use compound interest in **computing amounts** over a period of some years. They solve problems to **find interest** by applying the formula.

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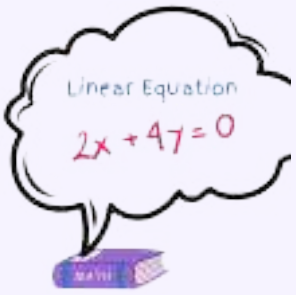
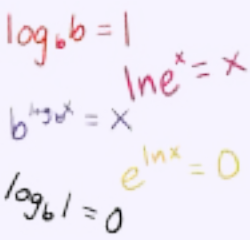
Algebra - Polynomials: 10-14 Classes

Students learn about polynomials, constant, linear, quadratic and cubic polynomials. They determine the **degree** of a polynomial, and find the **roots** of a polynomial using various methods and techniques. Students practise **factoring polynomials**, and learn the **Remainder and Factor theorems**. Students solve equations using **algebraic identities.**

Algebra - Linear Equations in 2 variables: 5-10 Classes

Students are introduced to linear equations in two variables. They learn to plot a linear equation in 2 variables, and show that they lie on a line. Students explore a pair of linear equations in 2 variables. They frame these simultaneous equations from given **word problems** and solve these equations using the methods of : **graphing, substitution, elimination**, and **cross multiplication**.





Logarithms: 4-6 Classes

Students learn about logarithms and how to evaluate them. They convert between **exponential** and **logarithmic form** for rational number bases. Students study the **product, quotient** and **power properties**, and the **change of base formula.**

Coordinate Geometry: 5-7 Classes

Students review the **Cartesian plane**, coordinates of a point, names and terms associated with thecoordinate plane, and its notations. They perform plotting of points in the plane for given coordinates, and find the distance between two points using the **distance formula**.

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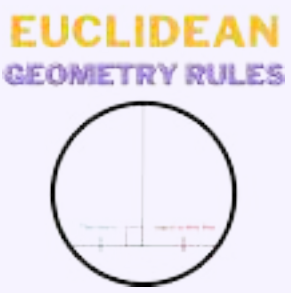
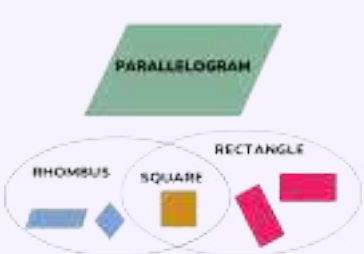
Geometry - Euclid's Geometry: 4-7 Classes

Students learn about Euclid's geometry, They learn the **5 Euclid's axioms/postulates** and theorems.





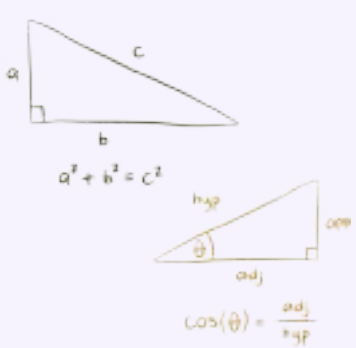
Geometry - Quadrilaterals: 10-14 Classes

Students learn properties of p**arallelograms, rectangles, squares and rhombus**, and learn to prove that a quadrilateral is any of these. They also learn to write **proofs involving triangles and quadrilaterals**, using their properties.

Geometry - Triangles: 9-12 Classes

Students learn to identify congruent triangles using **SSS, SAS, ASA** and **AAS** Theorems. They prove **triangles congruent** by these theorems. They solve problems based on **triangle properties**.

Geometry - Pythagorean Theorem and Trigonometry: 10-12 Classes



Students learn about the **Pythagoras theorem** and **prove it**. The learn trigonometry through the definition of the **trigonometric ratios of sin, cos and tan**. Students **solve simple 2-D problems** involving one right-angled triangle. They learn trigonometric ratios of **complementary angles** and their direct application. Students learn the values of the trigonometric ratios of the standard angles from 0 to 90 degrees.

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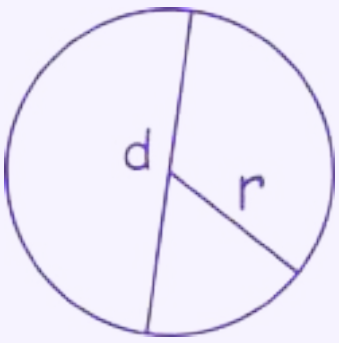
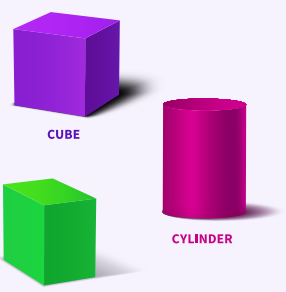
Geometry - Circle: 8-10 Classes

Students learn about circle, and its parts such as **center, radius, arc, central** and **inscribed angles.** They learn about **chords** and **arcs** and their **properties** and **prove results** on circle angles, chords and arcs using these properties.



Mensuration - Area And Perimeter: 15-20 Classes

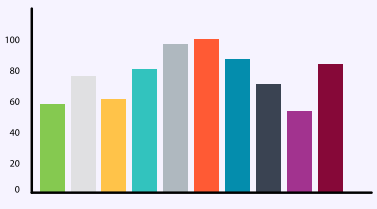


Students study area and perimeter of **triangles, quadrilaterals**, and **circles**. They find area of a triangle using **Heron's formula**. Students learn how to find the **surface area** and **volume of solids** such as cubes, cuboids, spheres, hemispheres, cylinders, pyramids, cones, and compound figures that may be formed by combinations of these solids. Students solve problems to find **different internal and external dimensions of solids**. They also solve **word problems** to compute **cost** of painting, fencing, tiling these solids.

Probability: 5-8 Classes

Students explore **classical probability** and solve simple problems to find the probability of an event.

Statistics: 8-12 Classes



Students learn how to collect, organize, and display data using **bar graphs, histograms and frequency polygons**. Students work with **grouped data** and understand how to create **frequency tables** using class intervals, class boundaries and limits. Students learn about the **mean, median**, and **mode** as measures of central tendency and how to calculate them.

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