NATIONAL PRIMTALENT OLYMPIAD EXAMINATIONS

CLASS X

MATHEMATICS

Commercial Applications

- Simple interest Compound interest
- Find the percent: discount and mark-up
- Multi-step problems with percents

ALGEBRA

Factorising and Expansions

- HCF of monomials
- Factorise out a monomial
- Factorise quadratics with leading coefficient
- Factorise by grouping
- Factorise polynomials

Logarithms and Exponents

Ratios, rates and proportions

- Identify and Write an equivalent ratio
- Solve proportions and word problems
- Scale drawings: word problems

Linear equations

- Write linear equations to solve word problems
- Compare linear equations, graphs and tables
- Write equations in standard form
- Standard form: graph an equation
- Solve a pair of equations by graphing
- Solve a pair of equations by graphing: word problems
- Find the number of solutions to a pair of equations by graphing Word Problems

Matrices

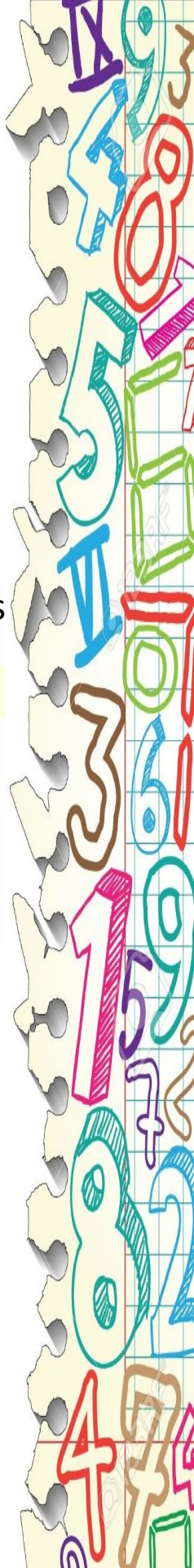
- Matrix vocabulary
- Matrix operation rules
- Add and subtract matrices
- Multiply a matrix by a scalar
- Multiply two matrices

Arithmetic and Geometric Progressions

- Arithmetic/Geometric sequences
- Evaluate variable expressions for AP/GP sequences
- Write variable expressions for AP/GP sequences
- sum of AP/GP series

Rational and Irrational Numbers

- Rational, irrational numbers as real numbers, their place in the number system, Surds and rationalization of surds
- Irrational numbers as non-repeating, non-terminating decimals.
- Classical definition of a rational number p/q, p, q ε Z, q≠ 0. Hence, define irrational numbers as what cannot be expressed as above.
- Simplifying an expression by rationalizing the denominator.
- Number lines
- Convert between decimals and fractions
- Identify rational and irrational numbers, Compare and order rational numbers
- Prime factorisation, Square roots
- Cube roots

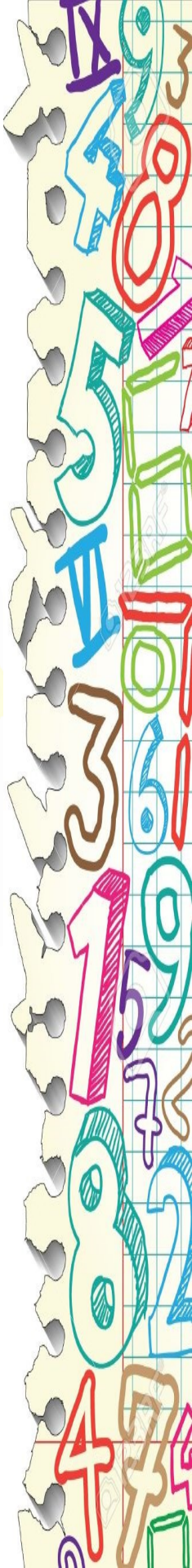


GEOMETRY

- Similarity
- Identify similar figures
- Similarity ratios
- Side lengths and angle measures in similar figures
- Similar triangles and indirect measurement
- Perimeters, Areas of similar figures
- Similarity rules for triangles
- Right triangles
- Pythagoras' Theorem
- Converse of Pythagoras' theorem
- Pythagoras' Inequality Theorems
- Special right triangles
- Lengths of segments on number lines
- Midpoints, Congruent line segments
- Perpendicular Bisector Theorem , Midpoint formula , Distance formula

Quadrilaterals and Polygons

- Classify quadrilaterals
- Properties of parallelograms
- Proving a quadrilateral is a parallelogram
- Exterior angles Interior angles of polygons
- Properties of rhombuses Properties of squares and rectangles, trapeziums



MENSURATION

Surface area and volume

- Introduction to surface area and volume
- Surface area of prisms, cylinders, cones
- Volume of prisms and cylinders, Volume of cones
- Surface area and volume of spheres, solids

PROBABILITY

- Theoretical probability
- Experimental probability
- Compound events: find the number of outcomes
- Identify independent and dependent events
- Probability of independent and dependent events

STATISTICS

- Mean, median, mode and range
- Quartiles

Data and graphs

- Interpret histograms
- Create histograms
- Interpret stem-and-leaf plots