

Mathematics: Embedded content

LO	Grade 10	Grade 11	Grade 12
LO 1: Number and Number Relationships When solving problems, the learner is able to recognise, describe, represent and work confidently with numbers and their relationships to estimate, calculate and check solutions.			
	- Rational and irrational - Exponents (integer) - Number patterns - Simple and compound growth - Exchange rates	- real numbers - exponents (rational) and surds - number patterns - simple and compound decay	- logarithms - number patterns including sequences and series - annuities and bond repayments and sinking funds - investments and loans
LO 2: Functions and Algebra The learner is able to investigate, analyse, describe and represent a wide range of functions and solve related problems.			
	- Investigating properties of functions via point-by-point plotting (linear, quadratic, rational, power, trigonometric) - Convert between various representations of functions - Algebraic manipulations (products, factorisation, algebraic fractions with monomial denominators) - Solving equations (linear, quadratic [factorisation only], exponential) - Linear inequalities - Simultaneous equations (linear) - Average rate of change	- Investigating properties of functions via point-by-point plotting (various transformations of quadratic, rational, power, trigonometric) - Convert between various representations of functions - Algebraic manipulations (completing the square, algebraic fractions with binomial denominators) - Solving quadratic equations - Simultaneous equations (one linear and the other quadratic) - Average gradient and gradient at a point - Linear programming	- Inverses of relations and functions (linear, quadratic, exponential) - Factorise 3rd degree polynomials (including factor theorem) - Differential calculus - Linear programming
LO 3: Space, Shape and Measurement The learner is able to describe, represent, analyse and explain properties of shapes in 2D and 3D space with justification.			
	- Volume and surface area of right prisms and cylinders - Geometry of triangles, quadrilaterals and other polygons (via Euclidean, coordinate and transformation methods) - Coordinate geometry (distance formula, gradient, midpoint formula) - Translations and reflections on the Cartesian plane - Basic trig ratios - problems in 2D using trig ratios - Historical development of geometry and trigonometry (project)	- Volume and surface area of right pyramids, right cones and spheres - Similarity of polygons with emphasis on triangles - Theorem of Pythagoras - Coordinate geometry (equation of a straight line, parallel and perpendicular lines) - Rotations and dilations (enlargements) on the Cartesian plane - Special angles, Basic Trig identities, Reduction formulae - General solution of trig equations - Sine-, cos- and area formulae - Problems in 2D and 3D - Historical development of geometry and trigonometry (project)	- Geometry of circles - Coordinate geometry : circles - Use of compound angle identities to investigate rotations in the Cartesian plane - Rigid transformations - Derive and apply compound angle identities - Heights and distances in 2D and 3D - Historical development of geometry - Other geometries e.g. spherical, taxi-cab, fractals
LO 4: Data Handling The learner is able to collect, summarise, display, analyse and interpret data to establish statistical and probability models to solve related problems and critically interrogate findings and draw conclusions			
	- Measures of central tendency (mode mean and median of grouped and ungrouped data) - Measures of dispersion (range, percentiles, quartiles) - Different representations of data - Relative frequency and probability - Use of Venn diagrams to solve probability problems - Sources of bias and errors - Investigative project	- Measures of central tendency and dispersion in univariate data (5# summary, box and whisker plots, ogives, variance and standard deviation) - Represent bivariate data as scatter plots and suggest intuitive curves of best fit (linear, quadratic, exponential) - Dependent and independent events (use of 2-way contingency tables and Venn diagrams to identify) - Use tree and Venn diagrams to solve probability problems - Sources of bias and errors in measurements - Differentiate between symmetric and skewed data - Investigative project	- Sampling and sample size - Regression function (curves of best fit for bivariate data) - Calculate correlation coefficient - Fundamental counting principle - Sources of bias and errors in measurements - Normally distributed data - Investigative project