

SKILLS	GRADE	NUMBER	ALGEBRA
<p>Grade 5</p> <p>To achieve grade 5, candidates will be able to:</p> <ul style="list-style-type: none"> perform routine single- and multi-step procedures effectively by recalling, applying and interpreting notation, terminology, facts, definitions and formulae interpret and communicate information effectively make deductions, inferences and draw conclusions construct chains of reasoning, including arguments generate strategies to solve mathematical and non-mathematical problems by translating them into mathematical processes, realising connections between different parts of mathematics interpret results in the context of the given problem evaluate methods and results competently complete all lower grade methods as well as most of those listed in the 4 - 5 content boxes 	Grades 4 - 5	<p>Structure and calculation</p> <ul style="list-style-type: none"> calculate with roots, and with integer indices calculate exactly with multiples of π 	<p>Notation, Vocab & manipulation</p> <ul style="list-style-type: none"> understand and use the concepts and vocabulary of identities simplify and manipulate algebraic expressions (including those involving surds) <ul style="list-style-type: none"> expanding products of two binomials factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments
<p>Grade 4</p> <p>To achieve grade 4, candidates will be able to:</p> <ul style="list-style-type: none"> perform routine single- and some multi-step procedures by recalling, applying and interpreting notation, terminology, facts, definitions and formulae interpret and communicate most forms information effectively make deductions, inferences and draw conclusions construct chains of reasoning, including arguments generate strategies to solve simple mathematical and non-mathematical problems by translating them into mathematical processes, realising connections between different parts of mathematics interpret results in the context of the given problem evaluate methods and results competently complete all lower grade methods as well as some of those listed in the 4 - 5 content boxes 		<p>Measures and accuracy</p> <ul style="list-style-type: none"> use inequality notation to specify simple error intervals due to truncation or rounding apply and interpret limits of accuracy (not bounds) 	<p>Graphs</p> <ul style="list-style-type: none"> use the form $y = mx + c$ to identify parallel lines; find the equation of the line through two given points, or through one point with a given gradient identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically recognise, sketch and interpret graphs, simple cubic functions, the reciprocal function $y = 1/x$ with $x \neq 0$ plot and interpret graphs (including reciprocal graphs) <p>Solving Eqn and inequalities</p> <ul style="list-style-type: none"> solve linear equations in one unknown with the unknown on both sides of the equation algebraically solve quadratic equations algebraically by factorising; find approximate solutions using a graph solve two simultaneous equations in two variables (linear/linear) algebraically; find approximate solutions using a graph translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution. solve linear inequalities in one variable, represent the solution set on a number line <p>Sequences</p> <ul style="list-style-type: none"> recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (rn where n is an integer, and r is a rational number > 0)

SKILLS	GRADE	RATIO,PROPORTION & RATE OF CHANGE	Geometry and Measures
<p>Grade 5</p> <p>To achieve grade 5, candidates will be able to:</p> <ul style="list-style-type: none"> perform routine single- and multi-step procedures effectively by recalling, applying and interpreting notation, terminology, facts, definitions and formulae interpret and communicate information effectively make deductions, inferences and draw conclusions construct chains of reasoning, including arguments generate strategies to solve mathematical and non-mathematical problems by translating them into mathematical processes, realising connections between different parts of mathematics interpret results in the context of the given problem evaluate methods and results competently complete all lower grade methods as well as most of those listed in the 4 - 5 content boxes 	Grades 4 - 5	<ul style="list-style-type: none"> change freely between compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts use compound units such as speed, rates of pay, unit pricing, density and pressure compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors understand that X is inversely proportional to Y is equivalent to X is proportional to $\frac{1}{Y}$; interpret equations that describe direct and inverse proportion set up, solve and interpret the answers in growth and decay problems, including compound interest 	<p>Properties and constructions</p> <ul style="list-style-type: none"> use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); use these to construct given figures and solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS) apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including Pythagoras' Theorem and the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering enlargement (including fractional scale factors) identify and apply circle definitions and properties, including: tangent, arc, sector and segment construct and interpret plans and elevations of 3D shapes
<p>Grade 4</p> <p>To achieve grade 4, candidates will be able to:</p> <ul style="list-style-type: none"> perform routine single- and some multi-step procedures by recalling, applying and interpreting notation, terminology, facts, definitions and formulae interpret and communicate most forms information effectively make deductions, inferences and draw conclusions construct chains of reasoning, including arguments generate strategies to solve simple mathematical and non-mathematical problems by translating them into mathematical processes, realising connections between different parts of mathematics interpret results in the context of the given problem evaluate methods and results competently complete all lower grade methods as well as some of those listed in the 4 - 5 content boxes 			<p>Mensuration and calculation</p> <ul style="list-style-type: none"> know the formulae: surface area and volume of spheres, pyramids, cones and composite solids calculate arc lengths, angles and areas of sectors of circles apply the concepts of congruence and similarity, including the relationships between lengths, in similar figures know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$, and the trigonometric ratios, $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$, $\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ and $\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$; apply them to find angles and lengths in right-angled triangles in two dimensions know the exact values of $\sin \theta$ and $\cos \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90°; know the exact value of $\tan \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and 60° <p>Vectors</p> <ul style="list-style-type: none"> apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors

SKILLS	GRADE	PROBABILITY	STATISTICS
<p>Grade 5</p> <p>To achieve grade 5, candidates will be able to:</p> <ul style="list-style-type: none"> perform routine single- and multi-step procedures effectively by recalling, applying and interpreting notation, terminology, facts, definitions and formulae interpret and communicate information effectively make deductions, inferences and draw conclusions construct chains of reasoning, including arguments generate strategies to solve mathematical and non-mathematical problems by translating them into mathematical processes, realising connections between different parts of mathematics interpret results in the context of the given problem evaluate methods and results competently complete all lower grade methods as well as most of those listed in the 4 - 5 content boxes 	<p>Grades 4 - 5</p>	<ul style="list-style-type: none"> understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size enumerate sets and combinations of sets systematically, using tree diagrams calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions 	<ul style="list-style-type: none"> infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling interpret and construct tables and line graphs for time series data and know their appropriate use use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing
<p>Grade 4</p> <p>To achieve grade 4, candidates will be able to:</p> <ul style="list-style-type: none"> perform routine single- and some multi-step procedures by recalling, applying and interpreting notation, terminology, facts, definitions and formulae interpret and communicate most forms information effectively make deductions, inferences and draw conclusions construct chains of reasoning, including arguments generate strategies to solve simple mathematical and non-mathematical problems by translating them into mathematical processes, realising connections between different parts of mathematics interpret results in the context of the given problem evaluate methods and results competently complete all lower grade methods as well as some of those listed in the 4 - 5 content boxes 			