SKILLS	GRADE	NUMBER	ALGEBRA
Grade 9 To achieve grade 9, candidates will be able to: • Be in the top 20% of pupils achieving a grade 7 or higher • Demonstrate a mastery of all subject content no matter the context or situation • perform procedures accurately • interpret and communicate complex information accurately • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and formal proofs • generate efficient strategies to solve complex mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, which may not be immediately obvious, between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, arguments, results and the assumptions made	Grades 6 - 9	**Structure and calculation** • apply systematic listing strategies including use of the product rule for counting • estimate powers and roots of any given positive number • calculate with roots, and with fractional indices • calculate exactly with surds; simplify surd expressions involving squares and rationalise denominators	**Notation, Vocab & manipulation** • simplify and manipulate algebraic expressions involving algebraic fractions • expanding products of two or more binomials • factorising quadratic expressions of the form x 2 + bx + c, including the difference of two squares; factorising quadratic expressions of the form ax2 + bx + c • use algebra to support and construct proofs • interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'
Grade 8 To achieve grade 8, candidates will be able to: • perform procedures accurately • interpret and communicate complex information accurately • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and formal proofs • generate efficient strategies to solve complex mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, which may not be immediately obvious, between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, arguments, results and the assumptions made • competently complete all lower grade methods as well as those listed in the 6 - 9 content boxes		**Fractions, decimals & percentages** • change recurring decimals into their corresponding fractions and vice versa	**Graphs** • use the form y = mx + c to identify perpendicular lines • deduce turning points by completing the square • recognise, sketch and interpret graphs of exponential functions y = kx for positive values of k, and the trigonometric functions (with arguments in degrees) y = sin x , y = cos x and y = tan x for angles of any size • sketch translations and reflections of a given function • plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration • calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts • recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given point
Grade 7 To achieve grade 7, candidates will be able to: • perform procedures to a good level of accuracy • interpret and communicate complex information effectively and succinctly • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and elements of formal proofs • generate efficient strategies to solve a variety of mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, between different parts of mathematics • interpret results in the context of the given problem • evaluate methods, arguments, results and the assumptions made • competently complete all lower grade methods as well as half of those listed in the 6 - 9 content boxes		**Measures and accuracy**	**Solving Eqn and inequalities**
Grade 6 To achieve grade 6, candidates will be able to: • perform routine procedures effectively by recalling, applying and interpreting notation, terminology, facts, definitions and formulae. Showing a high level of accuracy within these procedures. • interpret and communicate complex information • make deductions and inferences and draw conclusions • construct chains of reasoning, including convincing arguments • generate efficient strategies to solve a variety of mathematical and non-mathematical problems by translating them into a series of mathematical processes, realising connections between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, results and if necessary the assumptions made • competently complete all lower grade methods as well as some of those listed in the 6 - 9 content boxes		• upper and lower bounds	• solve quadratic equations that require rearrangement algebraically by factorising, by completing the square and by using the quadratic formula; • solve two simultaneous equations in two variables that are linear/quadratic • find approximate solutions to equations numerically using iteration • solve linear inequalities in two variables, and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph **Sequences** • recognise and use simple geometric progressions (rn where n is an integer, and r is a rational number > 0 or a surd) and other sequences • deduce expressions to calculate the n th term of quadratic sequences.

SKILLS	GRADE	RATIO,PROPORTION & RATE OF CHANGE	Geometry and Measures	PROBABILITY
Grade 9 To achieve grade 9, candidates will be able to: • Be in the top 20% of pupils achieving a grade 7 or higher • Demonstrate a mastery of all subject content no matter the context or situation • perform procedures accurately • interpret and communicate complex information accurately • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and formal proofs • generate efficient strategies to solve complex mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, which may not be immediately obvious, between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, arguments, results and the assumptions made	Grades 6 - 9	• construct and equations that describe direct and inverse proportion • interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts • set up, solve and interpret the answers in growth and decay problems, including compound interest and work with general iterative processes.	**Properties and constructions** • identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering enlargement with negative scale factors • describe the changes and invariance achieved by combinations of rotations, reflections and translations • apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results	• calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams.
Grade 8 To achieve grade 8, candidates will be able to: • perform procedures accurately • interpret and communicate complex information accurately • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and formal proofs • generate efficient strategies to solve complex mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, which may not be immediately obvious, between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, arguments, results and the assumptions made • competently complete all lower grade methods as well as those listed in the 6 - 9 content boxes			**Mensuration and calculation** • apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures • know the formulae for: Pythagoras' theorem, a2 + b2 = c2 , and the trigonometric ratios, sinθ = opposite hypotenuse , cosθ = adjacent hypotenuse and tanθ = opposite adjacent ; apply them to find angles and lengths in right-angled triangles and, where possible, general triangles in two and three dimensional figures • know and apply the sine rule and cosine rule to find unknown lengths and angles • know and apply Area =1/2 ab sin C to calculate the area, sides or angles of any triangle	
Grade 7 To achieve grade 7, candidates will be able to: • perform procedures to a good level of accuracy • interpret and communicate complex information effectively and succinctly • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and elements of formal proofs • generate efficient strategies to solve a variety of mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, between different parts of mathematics • interpret results in the context of the given problem • evaluate methods, arguments, results and the assumptions made • competently complete all lower grade methods as well as half of those listed in the 6 - 9 content boxes			**Vectors**	
Grade 6 To achieve grade 6, candidates will be able to: • perform routine procedures effectively by recalling, applying and interpreting notation, terminology, facts, definitions and formulae. Showing a high level of accuracy within these procedures. • interpret and communicate complex information • make deductions and inferences and draw conclusions • construct chains of reasoning, including convincing arguments • generate efficient strategies to solve a variety of mathematical and non-mathematical problems by translating them into a series of mathematical processes, realising connections between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, results and if necessary the assumptions made • competently complete all lower grade methods as well as some of those listed in the 6 - 9 content boxes			• use vectors to construct geometric arguments and proofs	

SKILLS	GRADE	STATISTICS
Grade 9 To achieve grade 9, candidates will be able to: • Be in the top 20% of pupils achieving a grade 7 or higher • Demonstrate a mastery of all subject content no matter the context or situation • perform procedures accurately • interpret and communicate complex information accurately • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and formal proofs • generate efficient strategies to solve complex mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, which may not be immediately obvious, between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, arguments, results and the assumptions made	Grades 6 - 9	• construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use • interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: o appropriate graphical representation involving discrete, continuous and grouped data, including box plots o appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers, quartiles and inter-quartile range)
Grade 8 To achieve grade 8, candidates will be able to: • perform procedures accurately • interpret and communicate complex information accurately • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and formal proofs • generate efficient strategies to solve complex mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, which may not be immediately obvious, between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, arguments, results and the assumptions made • competently complete all lower grade methods as well as those listed in the 6 - 9 content boxes		
Grade 7 To achieve grade 7, candidates will be able to: • perform procedures to a good level of accuracy • interpret and communicate complex information effectively and succinctly • make deductions and inferences and draw conclusions • construct substantial chains of reasoning, including convincing arguments and elements of formal proofs • generate efficient strategies to solve a variety of mathematical and non-mathematical problems by translating them into a series of mathematical processes • make and use connections, between different parts of mathematics • interpret results in the context of the given problem • evaluate methods, arguments, results and the assumptions made • competently complete all lower grade methods as well as half of those listed in the 6 - 9 content boxes		
Grade 6 To achieve grade 6, candidates will be able to: • perform routine procedures effectively by recalling, applying and interpreting notation, terminology, facts, definitions and formulae. Showing a high level of accuracy within these procedures. • interpret and communicate complex information • make deductions and inferences and draw conclusions • construct chains of reasoning, including convincing arguments • generate efficient strategies to solve a variety of mathematical and non-mathematical problems by translating them into a series of mathematical processes, realising connections between different parts of mathematics • interpret results in the context of the given problem • critically evaluate methods, results and if necessary the assumptions made • competently complete all lower grade methods as well as some of those listed in the 6 - 9 content boxes		