Number & Quantity

Skill	Grade 6	Grade 7	Grade 8	Grade 9 (SL/HL)	Grade 10 (SL/HL)
Rational Number Operations	• Place value and large numbers • Multi-digit and decimal division • Operations with decimals, fractions, and mixed numbers • Apply rational operations in context	• Operations with rational numbers • Convert terminating and repeating decimals and fractions • Connect fractions, decimals, and percents • Apply operations to multi-step problems	• Classify and represent real numbers • Convert fractions, decimals, and repeating decimals • Apply rational operations in equations and models	• Scientific notation • Significant figures and precision • Roots and radicals in algebraic work	• Number sets • Apply number skills in probability, statistics, sequences, and modeling • HL: Mean and standard deviation calculations
Integers & Absolute Value	• Understand and use negative numbers • Plot integers on number lines and the coordinate plane	• Add, subtract, multiply, and divide integers • Apply sign rules in calculations	• Classify integers within the real number system • Use integer exponents	• Apply integer and sign rules in algebraic work	• HL: Apply modulus in non-linear function work
Irrational Numbers & Approximations	• Recognize perfect squares and cubes through whole-number exponents		• Distinguish rational and irrational numbers • Approximate and locate irrational numbers • Simplify radicals	• Simplify and apply roots and radicals	• Use exact trigonometric values on the unit circle
Exponents & Powers of 10	• Evaluate expressions with whole-number exponents	• Evaluate whole-number exponents in numeric expressions	• Apply integer exponent rules • Work with scientific notation	• Apply exponent rules • Work with scientific notation	• Work with exponential functions • HL: Work with logarithms and logarithmic functions

Algebra

Skill	Grade 6	Grade 7	Grade 8	Grade 9 (SL/HL)	Grade 10 (SL/HL)
Expressions & Properties	• Write, read, and evaluate expressions with variables • Identify terms, coefficients, and factors • Use the distributive property	• Evaluate numeric and algebraic expressions • Apply order of operations • Use the distributive property and substitution	• Simplify algebraic expressions • Work with expressions involving integer exponents	• Multiply polynomials • Factor expressions and trinomials • HL: Work with conjugates and binomial multiplication	• Manipulate forms involving quadratic, exponential, and trigonometric functions • HL: Work with logarithmic, modulus, reciprocal, and rational forms
Equations	• Write equations from context • Use substitution to evaluate and check expressions	• Write equations from context • Substitute and evaluate expressions	• Solve one-variable linear equations	• Solve linear equations • Solve quadratic equations	• Use equations in function models • HL: Solve trigonometric equations
Inequalities	• Write inequalities from context	• Write, solve, and graph inequalities		• Solve linear inequalities • HL: Solve compound inequalities • HL: Graph systems of linear inequalities • HL: Solve quadratic inequalities	
Systems	• Represent proportional relationships with tables and equations	• Compare proportional relationships in tables and graphs	• Solve systems of linear equations	• Solve systems of linear equations • HL: Graph simultaneous linear inequalities	

Functions

Skill	Grade 6	Grade 7	Grade 8	Grade 9 (SL/HL)	Grade 10 (SL/HL)
Function Concept	• Represent proportional relationships with tables, graphs, and equations	• Interpret proportional relationships in tables and graphs	• Define and evaluate functions • Compare functions in different forms • Use functions to model relationships	• Represent linear relationships with equations and graphs	• Use function notation, domain, and range • Work with composite and inverse functions
Linear functions (rate of change)	• Write proportional relationships as y = kx	• Interpret unit rate as slope • Graph proportional relationships through the origin	• Interpret slope and intercept • Model linear relationships from tables, graphs, equations, and data	• Write and graph equations of lines • Use linear models and systems	• Model direct and inverse proportion • Use functions to model real situations
Quadratic Functions				• Multiply and factor polynomials • Solve quadratic equations • HL: Use the sum and product of roots • HL: Use the discriminant • HL: Solve quadratic inequalities	• Work with quadratic functions • Transform and model quadratic functions
Exponential & Logarithmic Functions					• Work with exponential functions • HL: Work with logarithms and logarithmic functions
Other non-linear functions					• Transform functions graphically • HL: Work with modulus, reciprocal, and rational functions

Geometry

Skill	Grade 6	Grade 7	Grade 8	Grade 9 (SL/HL)	Grade 10 (SL/HL)
Coordinate Geometry	• Plot points in all four quadrants • Draw polygons from coordinates • Reflect figures over the x- and y-axes	• Use the coordinate plane for proportional relationships and inequalities	• Find distance on the coordinate plane • Apply transformations in the coordinate plane	• Work with coordinate geometry, equations of lines, and systems • HL: Extend coordinate geometry to three dimensions • HL: Graph linear inequalities and systems	• Connect coordinate graphs to functions and models
Area & Surface Area	• Find areas of triangles, quadrilaterals, and polygons • Find surface area using nets	• Work with circles and circumference • Use nets and three-dimensional sections • Find surface area	• Solve problems involving two- and three-dimensional figures	• Solve surface-area and volume problems • Find triangle area using trigonometry • HL: Find arc length and sector area	
Volume	• Find the volume of rectangular prisms	• Solve volume and surface-area problems	• Calculate and solve problems involving the volumes of cylinders, cones, and spheres	• Solve surface-area and volume problems	
Transformations & Symmetry	• Reflect figures over the x- and y-axes	• Apply scale factor to geometric figures	• Apply translations, reflections, rotations, and dilations	• Apply congruence and similarity	• Transform functions graphically
Trigonometry				• Apply right-triangle trigonometry • Apply the sine rule and cosine rule • Find the area of a non-right triangle • HL: Convert between radians and degrees • HL: Find arc length and sector area	• Work in radians and degrees • Use the unit circle, reference angles, and exact values • Work with trigonometric functions • HL: Solve trigonometric equations

Statistics & Probability

Skill	Grade 6	Grade 7	Grade 8	Grade 9 (SL/HL)	Grade 10 (SL/HL)
Data Displays	• Construct and interpret line plots, dot plots, histograms, and box plots	• Compare samples and populations • Compare means, medians, and variability	• Construct and interpret scatter plots • Use lines of best fit and linear models		• Represent data using box plots, stem-and-leaf plots, and cumulative-frequency graphs
Measures & Interpretation	• Calculate and interpret mean, median, quartiles, and interquartile range	• Compare means, medians, and variability	• Interpret direction and strength of association in bivariate data		• Calculate measures of central tendency and five-number summaries • HL: Calculate and interpret mean and standard deviation
Probability		• Determine simple and compound probability			• Determine probabilities of individual and compound events
Counting Methods					• HL: Apply factorials, the counting principle, permutations, and combinations

Quick Sequence Check - Internal Planning Only

✅ Explicit in the current sequence | ⚠️ Partial, preparatory, or HL-only | ❌ Not explicit

🔢 NUMBER & ALGEBRA

IB Topic	G6	G7	G8	G9 SL/ HL	G10 SL/ HL	Notes
Number systems (ℕ, ℤ, ℚ, ℝ)	⚠️	⚠️	✅	⚠️	✅	Real-number classification begins in G8; G10 revisits number sets
SI units & derived units	✅	✅	⚠️	⚠️	❌	Explicit conversions in G6-G7; later use is contextual
Rounding & significant figures	⚠️	❌	❌	✅	❌	Significant figures are Grade 9 core; bounds are not explicit
Absolute value (modulus)	❌	❌	❌	⚠️	⚠️	Modulus is explicit only in G10 HL
Operations (integers, fractions, decimals)	✅	✅	✅	⚠️	⚠️	Explicit in G6-G8; applied within later units
Prime numbers, factors, multiples	✅	❌	❌	❌	❌	Explicit in G6
GCF & LCM	⚠️	❌	❌	❌	❌	Related G6 factor work; GCF/LCM not named
Ratio, percent, proportion	✅	✅	✅	❌	✅	Returns in G10 through direct and inverse proportion
Algebraic manipulation (expand/factor)	✅	✅	✅	✅	✅	Strong progression
Rearranging formulae	❌	❌	⚠️	⚠️	⚠️	Used implicitly but not named as a standalone skill
Substitution	✅	✅	✅	✅	✅	Strong progression
Exponents (positive)	✅	✅	✅	✅	✅	Explicit throughout the sequence
Rational exponents	❌	❌	❌	⚠️	⚠️	Not explicit as rational exponents
Inequalities & intervals	⚠️	✅	❌	✅	❌	G9 HL adds compound, systems, and quadratic inequalities

Surds / radicals	❌	❌	✅	✅	⚠️	Explicit in G8-G9; connected to exact values in G10
Rationalising denominator	❌	❌	❌	⚠️	❌	May occur within G9 radical work but is not explicit
Scientific notation	❌	❌	✅	✅	❌	Explicit in G8-G9
Currency familiarity	⚠️	⚠️	❌	❌	❌	Possible context but not explicit
Linear equations/inequalities	⚠️	⚠️	✅	✅	❌	Different equation and inequality emphasis by grade
Quadratics	❌	❌	❌	✅	✅	Strong in G9-G10
Systems of equations	⚠️	⚠️	✅	✅	❌	Foundations in G6-G7; formal systems in G8-G9
Sets (notation, union/intersection)	❌	❌	❌	❌	⚠️	Number sets appear, but formal set operations do not
Algebraic fractions	❌	❌	❌	❌	❌	Not explicit in the current sequence

📈 FUNCTIONS

IB Topic	G6	G7	G8	G9 SL/ HL	G10 SL/H L	Notes
Linear graphing (technology)	⚠️	⚠️	⚠️	⚠️	⚠️	Graphing is explicit; technology use is not
Quadratic graphing	❌	❌	❌	⚠️	✅	G9 focuses on equations; G10 includes quadratic functions
Functions as mappings	⚠️	⚠️	✅	⚠️	✅	Function language is explicit in G8 and G10
Multiple representations	✅	✅	✅	✅	✅	Strong progression across representations

📐 GEOMETRY & TRIGONOMETRY

IB Topic	G6	G7	G8	G9 SL/ HL	G10 SL/ HL	Notes
Pythagorean theorem	⚠️	❌	✅	✅	⚠️	Explicit in G8-G9; later use is contextual
Midpoint & distance	❌	❌	✅	✅	❌	Distance is explicit in G8; coordinate geometry in G9
Basic geometry concepts	✅	✅	✅	✅	⚠️	Strong through G9; G10 emphasis shifts to functions and trig
Angle measurement	⚠️	✅	✅	✅	✅	Angle work develops from G7 through trigonometry
Triangle sum theorem	⚠️	⚠️	⚠️	⚠️	⚠️	Related triangle work is present; theorem not explicitly named
Right triangle trig	❌	❌	❌	✅	⚠️	Explicit in G9; G10 moves to unit-circle trigonometry
Bearings	❌	❌	❌	⚠️	❌	Possible G9 extension; not explicit in published units
Transformations	✅	⚠️	✅	⚠️	✅	Geometry transformations in G6-G8; function transformations in G10
Circle concepts	❌	✅	❌	⚠️	✅	Circle work in G7; G9 HL arc/sector; G10 unit circle
Area & perimeter	✅	⚠️	⚠️	✅	❌	Strongest in G6 and G9
3D shapes	✅	✅	✅	✅	❌	Strong G6-G9 progression
Volume & surface area	✅	✅	⚠️	✅	❌	G8 names volume; G9 includes surface area and volume

📊 STATISTICS & PROBABILITY

IB Topic	G6	G7	G8	G9 SL/ HL	G10 SL/ HL	Notes
Data representation	✅	⚠️	✅	❌	✅	No Grade 9 statistics unit in the current syllabus
Mean, median, mode, range	✅	✅	❌	❌	✅	Measures return in Grade 10
Simple probability	❌	✅	❌	❌	✅	Probability is explicit in G7 and G10
Venn diagrams	❌	❌	❌	❌	❌	Not explicit in the current sequence
Tree diagrams	❌	❌	❌	❌	❌	Not explicit in the current sequence

⚡ CALCULUS / MODELING

IB Topic	G6	G7	G8	G9 SL/ HL	G10 SL/ HL	Notes
Speed = distance ÷ time	⚠️	⚠️	⚠️	❌	❌	Rate foundations appear in G6-G8; the formula is not explicit