

MYP Mathematics Framework

<u>Numerical and abstract reasoning</u>	<u>Thinking with models</u>	<u>Spatial reasoning</u>	<u>Reasoning with data</u>
Number operations	Mapping	Classifying shapes and angles	Simple discrete data and classifications
Forms of numbers (integers, fractions, decimals and percentages) and transforming between them	Function notation Linear functions of the form $f(x)=mx+c$	Calculations with angle properties Angles in intersecting and parallel lines Metric conversions	Data collection and generation, including surveys Limitations and context in statistical enquiry (reliability of data, bias in sampling and estimation in calculations)
Number systems and notation (set of positive integers and zero (N), integers (Z), rational numbers (Q), irrational numbers (Q'), and real numbers (R))	Parallel and perpendicular lines Systems of equations/simultaneous equations including solving algebraically and graphically	Circle geometry and theorems, including angles, radius, diameter and tangent	Graphical representations, including pie, bar charts, stem and leaf plots, pictograms
Estimation, including using appropriate forms of rounding to estimate results, decimal approximations and significant figures	Quadratic functions in the form: $f(x)=ax^2+bx+c$ $f(x)=a(x-p)(x-q)$ $f(x)=a(x-h)^2+k$ including the significance of their parameters	Length of arc and chord, perimeter and area of sector and segment	Data visualisations and infographics
Recurring decimals	Representation and shape of exponential functions and their horizontal asymptotes	Perimeter (circumference) and area of plane figures including triangles, circles, parallelograms, rhombuses, rectangles, squares, kites, trapezoids and compound shapes	Data processing, including mean, median (measure of central tendency) and mode, for discrete and grouped data
Absolute values	Algorithms (analysing and using well-defined procedures for solving complex problems)	Volume, surface area and nets of cubes, cuboids, cylinders and prisms	Measures of dispersion, including range
Time zones, clocks and timetables	<u>Additional extended content</u>	Volume, surface area and nets of pyramids, cones and compound three-dimensional shapes	Qualitative handling of probability
Number lines and simple inequalities	Domain and Range	Coordinates	Probability of simple events
Representing inequalities, including compound and double inequalities	Rational functions of the form $f(x)=\frac{ax+b}{cx+d}$	$y=mx+c$, gradients and intercepts	Sample spaces
Factors of numbers	Linear programming, including inequalities	Gradients of parallel lines	Probability scale, including significance of number
Number sequences (prediction, description)	Transformation of quadratic functions, including translation, reflection and dilation	Coordinate geometry, including distance, midpoint and gradient formulae	Theoretical probability and experimental probability
Prime numbers and factors, including greatest common factor and least common multiple	Representation and shape of cubic, rational, trigonometric and logarithmic functions and their asymptotes	Symmetry and reflection	Sampling techniques and response rates
Squares and square roots	Networks, including edges and arcs, nodes/vertices, paths	Rotation around a given point	Data manipulation and misinterpretation
Surds, roots and radicals including simplifying	Calculating network pathways	Similarity and congruence, including proving similar and congruent triangles	Graphical representations, including bivariate graphs, scatter graphs, box-and-whisker plots, cumulative frequency graphs
Exponents	Weighted networks	Movement on a plane—isometric transformations, enlargements and tessellations	Lines of best fit
Laws of exponents including integer and negative exponents			Data processing, including mean, median (measure of central tendency) and mode, for continuous data, and quartiles and percentiles for discrete and continuous data
Standard form (scientific notation)			Measures of dispersion, including interquartile range (including application and relationship with the

Ratios	<i>Optional enrichment content</i>	Triangle properties	median)
Direct and inverse proportion		Bearings	Describing correlation, including positive, negative, none, strong and weak
Find and verify rules for sequences	Transforming cubic, and trigonometric functions	Pythagoras' theorem	Sets, including notation and operations up to three sets
Find, justify and prove general rules/formulae for sequences	Functions including $\ln$ and e	Trigonometric ratios in right-angled triangles	Probability calculations with Venn Diagrams, tree diagrams and sample space
Forming equations	Composite functions	<i>Additional extended content</i>	Mutually exclusive events
Solving simultaneous equations, including algebraically and graphically.	Inverse functions	Capacity	Combined events
Operating with algebraic expressions	Logarithmic functions	Relationship between gradients of perpendicular lines	Relative frequency
Substitution into expressions		Enlargement around a given point	<i>Additional extended content</i>
Expanding brackets		Enlargement by a rational factor	Histograms for continuous fixed interval groups
Factorising algebraic expressions		Identical representation of transformations	Measure of dispersion, including standard deviation (including application and relationship with the mean)
Factorising quadratic expressions		Converse of Pythagoras' theorem	Use of technology to find the numerical value for correlation and its meaning
Rearranging and solving simple equations		Sine rule and cosine rule, including applications (link to trigonometric functions)	Probability calculations for dependent and independent events (using the addition and multiplication rules) including conditional probability
Solving quadratic equations using factorization, the quadratic formula and graphically		<i>Optional enrichment content</i>	<i>Optional enrichment content</i>
Using formulae		Fractals (informal introduction)	Manual calculation of standard deviation and correlation coefficient
Flowcharts and simple algorithms		Dilation	Histograms and frequency polygons
Rearranging formulae		Inscribing and circumscribing shapes	Covariance
<i>Additional extended content</i>		Arc length and sector using radians	Interpolation and extrapolation
Lower and upper bounds		Polar coordinates	Confirmation bias
Logarithms, including laws of logarithms and use of technology to find values		Vector notation	Counting principles
Laws of exponents, including fractional/rational exponents		Vector spaces	Combinatorics
Using notation and formulae for arithmetic and geometric sequences to continue a sequence, find specific terms and the progression		Three-dimensional coordinate geometry	Permutations
<i>Optional enrichment content</i>		Area of a triangle rule	Factorials
		Unit circle	Geometric mean
		Radians	Regression—interpretation of results
		Equation of a circle with centre at the origin	Networks and probability, Pascal's triangle

Rationalizing the denominator		Trigonometric identities	
Number bases			
Exponential equations			
Use notation and formula to find the summation of an arithmetic sequence and a geometric sequence			
Sigma notation			
Convergence and divergence			