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	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Number Systems			
Different number systems	**1A:** Egyptian, Ancient Greek, Roman, Mayan, Chinese-Japanese		
The Hindu-Arabic system	**1B:** Identifying the value of a digit in a number (inc. place value). Given a list of digits, make the largest number you can. Putting a list of numbers in order. Expanded form ↔ numeral form. Word form ↔ numeral form.	**1A:** Word form ↔ numeral form. Identifying the value of a digit in a number (inc. place value). Putting a list of quantities/measurements in order. Expanded form ↔ numeral form. Given a list of digits, make the largest number you can.	
Big numbers	**1C:** millions, billions, trillions		
Operations with whole numbers			
Adding and subtracting whole numbers	**2A:** Additions (up to four numbers of four digits each), subtractions (up to four digits in each number), word problems with the same parameters		
Multiplying and dividing whole numbers	**2B:** Multiplying by powers of 10; multiplying larger numbers (two numbers, up to three digits); division by powers of 10; division by single digits; word problems with the same parameters; comparison notation (>, <, =, ≈)	**1D:** Products (pairs of numbers, 1 s.f. for each number). Quotients (first number has 1-2 s.f. and has up to 5 digits; second number has 1 s.f. and a maximum of 1000). Long multiplication (maximum of 3 digits per number). Long division (no remainders). Word problems using these parameters.	
Two step problem solving	**2C:** Up to 4 digits per number, problems involve two of the basic operations +, ×, ÷, −		
Number lines	**2D:** Placing numbers on a number line (positive numbers only); representing a series of operations (using +, ×, ÷, − only, no negative numbers)		
Rounding numbers	**2E:** Finding the nearest multiple of 10 or 100 either side of a number; given two numbers either side, pick which is closer; rounding off to the nearest 10/100/ 1000/10000/100000; rounding to 1/2/3 significant figures.	**1B:** Rounding off to the nearest 10/100/ 1000. Rounding to 1 or 2 significant figures.	**1F:** Rounding to the nearest whole number. **8F:** Rounding to 2/3/4 significant figures.
Estimation and approximation	**2F:** One figure approximations. Estimations of numbers of objects.	**1C:** One figure approximations. Estimations of numbers of objects.	
Rounding money			
Rounding time			
Points, Lines and Angles			
Points and lines	**3A:** Identifying real-life examples of points and lines; writing definitions of terms (e.g. vertex, point of intersection, parallel lines, etc.) and drawing a diagram to illustrate; naming straight lines (lines, line segments and rays); naming the intersection of lines (points and line segments)	**2A:** Identifying real-life examples of points and lines. Writing definitions of terms (e.g. vertex, point of intersection, parallel lines, etc.) and drawing a diagram to illustrate. Naming straight lines (lines, line segments and rays). Naming the intersection of lines ***(points only). Given a statement (involving points and lines), draw a diagram to fit.*** (Note: introduces the idea of ***collinear points***.)	

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Angles	**3B:** Classifying angles (acute, right, obtuse, straight, reflex, revolution); drawing diagrams to illustrate angles; estimating the size of angles; measuring angles using a protractor; naming angles (three letter notation e.g. BÂC)	**2B:** Naming angles (three letter notation e.g. BÂC). Drawing diagrams to illustrate angles ***(inc. freehand sketches with labels)***. ***Using a protractor to draw angles of a specified size.*** Measuring angles using a protractor ***(includes word problems)***.	**7A:** Classifying angles (acute, right, obtuse, straight, reflex, revolution) in a series of 'true or false' statements.
Angles at a point or on a line	**3C:** Angles in a right angle; angles on a straight line; Angles in a revolution (includes multiple instances of the same unknown)	**2C:** Angles in a right angle. Angles on a straight line. ***Identifying pairs of angles as complementary, supplementary or neither.*** Angles in a revolution (includes multiple instances of the same unknown)	**7A:** Angles in a right angle. Angles on a straight line. Angles in a revolution (includes multiple instances of the same unknown)
Angles of a triangle	**3D:** One unknown; multiple instances of the same unknown; one 'two-variable' problem (two triangles in the one diagram, variables are not linked); writing a rule connecting unknowns (either two or three in the triangle)	**14B:** Finding unknown angles in a triangle (using angle sum = 180°; can have the unknown appearing more than once). ***Finding unknown angles in a triangle (using exterior angle of triangle; can have unknown appearing more than once). Finding the unknown angles in a figure using triangles, with these theorems.***	**14B:** Finding unknown angles in a triangle (using angle sum = 180°; can have the unknown appearing more than once). Finding unknown angles in a triangle (using exterior angle of triangle; can have unknown appearing more than once). ***Given the angles of a triangle, state which side is the longest.*** Finding the unknown angles in a figure using triangles, with these theorems.
Angles of a quadrilateral	**3E:** One unknown; multiple instances of the same unknown; writing a rule connecting unknowns (either two, three or four in the quadrilateral)	**14F:** One unknown. Multiple instances of the same unknown. Writing a rule connecting unknowns (either two, three or four in the quadrilateral) ***Can have more than one unknown if supplementary angles are given).***	**7D:** One unknown. Multiple instances of the same unknown.
Bisecting angles, geometric construction	**3F:** Bisect a specified angle; bisect any acute angle; bisect any obtuse angle	**2D:** Constructing a 90° angle to a line. Constructing a perpendicular bisector. Constructing a perpendicular to an external point.	
Angle pairs		**2E:** Identifying corresponding angles. Identifying alternate angles. Identifying co-interior angles. Identifying vertically opposite angles.	
Parallel lines		**2F:** Finding the unknown angle, given a diagram involving parallel lines (up to three unknowns; multiple unknowns to be worked out in sequence; can include vertically opposite angles). Given a diagram involving parallel lines, write a statement connecting the unknowns. Given a diagram not drawn to scale, work out whether a pair of parallel lines is	**7A:** Finding the unknown angle, given a diagram involving parallel lines (up to ***four*** unknowns; multiple unknowns to be worked out in sequence; can include vertically opposite angles). Given a diagram not drawn to scale, work out whether a pair of parallel lines is present.
Location			
Map references	**4A:** Given a grid reference, find the feature on the map; given the feature on the map, find its grid reference		
Number grids	**4B:** Draw a set of axes and plot/label points; given a graph with points plotted, read off their coordinates; given a coordinate pair find the feature on the map; given the feature on the map, find its coordinates; "join the dots" problems		
Interpreting points on a grid	**4C:** Point graphs; variables represented on each axis; comparing points		
Bearings and directions	**4D:** Compass bearings; true bearings; given a diagram find the bearing of one point from another		
Number Properties			
Addition and subtraction	**5A:** Sums (up to four numbers of four digits each); differences (up to three digits in each number); word problems with the same parameters	**1D:** Sums (up to three numbers, rearranging to make the problem easier). Differences (up to 3 digits per number). Word problems involving these parameters.	

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Multiplication and division	**5B:** Products (pairs of numbers, 1 s.f. for each number); rearranging numbers in a product to make calculation easier (three numbers in a product); quotients (first number up to 4 digits, second number is 2-12/multiple of 10 up to 100); word problems with the same parameters	**1D:** Rearranging numbers in a product to make calculating easier (up to five numbers in the product). Products (pairs of numbers, 1 s.f. for each number). Quotients (first number has 1-2 s.f. and has up to 5 digits; second number has 1 s.f. and a maximum of 1000). Long multiplication (maximum of 3 digits per number). Long division (no remainders). Word problems using these parameters.	
Zero and one	**5C:** +, ×, ÷, − using 0; multiplying and dividing by 1	**1D:** +, ×, ÷, − using 0; multiplying and dividing by 1	
Index or exponent notation	**5D:** Writing products in index notation (up to three terms). Writing powers of 10 in index form. Writing 'index-form' numbers as ordinary numbers.	**1E:** Writing products in index notation (single product, up to three different numbers). Writing a product of 'index numbers' (up to 4 of them) in natural number form.	**1H:** Writing a product of 'index numbers' (up to 4 of them) in natural number form.
Order of operations	**5E:** Using +, ×, ÷, − and exponents, 1 and 2-digit numbers only, nested brackets. Given a BEDMAS statement with one or more of its operations blanked out, determining what operation (out of +, ×, ÷, −) should go there.	**1G:** Using +, ×, ÷, − and exponents, 1 and 2-digit numbers only, nested brackets. Given a BEDMAS statement with one or more of its operations blanked out, determining what operation (out of +, ×, ÷, −) should go there. ***Inserting brackets into a BEDMAS statement to make it true.***	**1D:** Inserting brackets into a BEDMAS statement to make it true. Given a BEDMAS statement ***with all of its operations removed***, determining what operation (out of +, ×, ÷, −) should go where.
Powers with base 10	**5F:** Converting between simplest form, expanded form and power form.		
Squares and cubes	**5G:** Squares up to 12×12. Square roots up to √400. Cubes up to 7×7×7=343. Cube roots up to √1000.	**1F:** Manually calculating squares up to 12×12. Using a calculator for squares up to 50×50. Investigating patterns involving squares and cubes. **3E:** Square roots up to √10000 ***(including using the calculator)***. Cube (and higher) roots up to √1000 ***(include negative numbers for 'odd roots')***.	**1H:** Using a calculator for squares ***and higher powers (including negatives)***. **9A:** Calculating square roots (including using the calculator, ***calculating the square root of decimal numbers***). **9I:** Cube roots up to √***2000*** (include negative numbers; ***can use a calculator***). ***Equations of the form x^3 = ...***
Factors of natural numbers	**5H:** Listing the factors of a number (up to 100). Even and odd numbers.	**3B:** Listing the factors of a number (up to 100). ***Given a partial factorisation, complete it.*** Even and odd numbers. ***Writing the largest factor (other than itself) of a number.***	**1A:** Listing the factors of a number (up to 100).
Divisibility tests	**5I:** Divisibility by 2-6.	**3A:** Divisibility by 2-6. ***Divisibility by 8-11.***	**1B:** Divisibility by 2-6.
Prime and composite numbers	**5J:** Listing prime numbers (up to three digits). Finding the prime factors of a number (up to three digits). Giving a reason why a number is not prime. Writing as a product of prime factors in index form (up to 5-digit numbers). Writing a number in index form. HCF (1 and 2-digit numbers, 2 or 3 of them).	**1E:** Writing a number in exponent form with … as a base. **3B:** Listing prime numbers. Giving a reason why a number is not prime. Writing as a product of prime factors in index form (up to ***4-digit numbers***). HCF (1 and 2-digit numbers, ***up to 4 of them***).	**1A:** HCF (1, 2 ***and 3-digit*** numbers, 2 or 3 of them). **1H:** Writing a number in exponent form with ***a prime number*** as a base. Writing as a product of prime factors in index form.
Multiples and LCM	**5K:** Listing multiples (of numbers up to 50). Finding the nth multiple of a single-digit number. LCM (1-digit numbers only, up to four of them). Word problems involving LCM. Finding the largest multiple less than some 3-digit number.	**3C:** Listing multiples (of numbers up to 50). Finding the nth multiple of a single-digit number. LCM (1-digit numbers only, up to four of them; there's one involving 5 numbers!). Word problems involving LCM. Finding the largest multiple less than some 3-digit number.	**1A:** Listing multiples (of numbers up to 50). Finding the largest multiple less than some 3-digit number. LCM (1 **and 2**-digit numbers, up to **three** of them). Word problems involving LCM.
Fractions			
Representing fractions	**6A:** Diagram, number line, symbol, words	**4A:** Diagram, number line, symbol, words	
Fractions of regular shapes	**6B:** Correct shading of a shape (circle, triangle, rectangle)	**4A:** Drawing diagram, dividing it correctly and shading appropriately to represent a fraction.	
Equal fractions	**6C:** Expressing a fraction with denominator *d* (where *d* is a multiple of the original denominator); given two equal fractions, fill in the blank (both showing the working and not showing working, × or ÷ by integers)	**4A:** Expressing a fraction with denominator *d* (where *d* is a multiple of the original denominator, ***or where d is a multiple of the simplified denominator***). Expressing a fraction with numerator *n*. Comparing two fractions and seeing which is bigger.	

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Simplifying fractions	**6D:** Fractions with BEDMAS expressions in the numerator and/or denominator (using +, ×, ÷, − and exponents, 1 and 2-digit numbers only, only 1 level of brackets); simplifying a fraction to lowest terms (proper fractions only, denominator up to 1000)	**1G, 4A:** Fractions with BEDMAS expressions in the numerator and/or denominator (using +, ×, ÷, − and exponents, 1 and 2-digit numbers only, only 1 level of brackets, ***can have negatives***). **4A:** Simplifying a fraction to lowest terms (proper fractions only, denominator up to 1000, ***can have negatives***).	**1D:** Fractions with BEDMAS expressions in the numerator and/or denominator (using +, ×, ÷, − and exponents, 1 and 2-digit numbers only, only 1 level of brackets, can have negatives).
Fractions of quantities	**6E:** Given a diagram, write a fraction describing the situation; writing fractions of measurements/ monetary amounts in simplest form; finding 1/*d* of a number (*d* may be up to 12); word problems with the same parameters	**4C:** Finding ***n/d*** of a number (***proper fractions only,*** *d* may be up to 12); word problems with the same parameters	
Comparing fraction sizes	**6F:** LCM (integers up to 12, up to 3 of them); writing a list of fractions so they all have the same denominator (1 or 2-digit denominators only) and then arranging them.	**4A:** Writing a list of fractions so they all have the same denominator (1 or 2-digit denominators only) and then arranging them.	
Improper fractions and mixed numbers	**6G:** Improper fractions as whole numbers or mixed numbers; mixed numbers to improper fractions		
Polygons and plane geometry			
Polygons	**7A:** Identifying polygons (inc. why a figure is *not* a polygon); identifying regular polygons; naming polygons; drawing polygons. Up to 12 sides.	**14D:** Identifying polygons (inc. why a figure is *not* a polygon); identifying regular polygons (***inc. why a figure is not a regular polygon***); naming polygons; drawing polygons. Up to	
Triangles	**7B:** Constructing a triangle (using compass and ruler, given three sides). Constructing a triangle (using protractor/compass/ruler, given two sides and an angle or two angles and a side). Classifying triangles (equilateral, scalene, isosceles).	**14A:** Classifying triangles (equilateral, scalene, isosceles).	**7C:** Classifying triangles as equilateral, scalene, isosceles (***triangles are not drawn to scale but information on them is correct***).
Angles of isosceles triangles	**7B:** Finding unknown sides and angles (using the properties of isosceles and equilateral triangles, up to two different variables)	**14C:** Finding unknown angles (using the properties of isosceles triangles; up to two different variables; a variable can appear more than once)	**7C:** Finding unknown sides and angles (using the properties of isosceles triangles; a variable can appear more than once).
Quadrilaterals	**7C:** Drawing fully-labelled diagrams of various quadrilaterals; classifying quadrilaterals; drawing specific quadrilaterals given a set of instructions; parallel and perpendicular notation; finding the unknown length or angle (using properties of quadrilaterals, up to 2 unknowns, not linked); constructing quadrilaterals (using ruler/compass/ set square/protractor)	**14E:** Finding the unknown length or angle (using properties of quadrilaterals, up to ***3*** unknowns, not linked). Classifying quadrilaterals (giving reasons).	**7F:** Finding the unknown length or angle (using properties of quadrilaterals). Classifying quadrilaterals (giving reasons).
Angles of a polygon		**14G:** Finding the sum of the angles in a polygon (using the formula). Finding unknown angles in a polygon (using angle sum formula; can have the unknown appearing more than once). Given the angle sum, work out how many sides the polygon has (or if the polygon is possible).	**7D:** Finding the sum of the angles in a polygon (using the formula). Finding unknown angles in a polygon (using angle sum formula; can have the unknown appearing more than once). Given the angle sum, work out how many sides the polygon has (or if the polygon is possible). ***Finding unknown angles in a polygon (exterior angles).***
Deductive geometry		**14H:** Figures using triangles, quadrilaterals, parallel lines.	**7E:** Figures using triangles, quadrilaterals, parallel lines. ***Investigating circle geometry (angle in a semicircle, angle at centre, cyclic quadrilaterals).***
Circle theorems			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Cyclic quadrilaterals			
Euler's rule for plane figures	**7D:** Given two of (edges, regions, vertices), find the third value; using that information to draw a possible figure.		
Fraction Operations			
Adding fractions	**8A:** Same denominator (up to 4 fractions); different denominators (LCD up to 100); adding mixed numbers; using a calculator (LCD > 100)	**4B:** Same denominator. Different denominators (LCD ***up to 50***). Mixed numbers. ***Can start with negative fractions***. Using a calculator.	**1E:** Same denominator. Different denominators (LCD up to 50). Mixed numbers. Using a calculator.
Subtracting fractions	**8B:** Answer must be positive. Same denominator; different denominator (LCD up to 100, can have 2 or 3 fractions strung together); mixed numbers; using a calculator (LCD > 100)	**4B:** Same denominator. Different denominators (LCD up to 50). Mixed numbers. ***Can start with negative fractions. Can have negative answers***. Using a calculator.	**1E:** Same denominator. Different denominators (LCD up to 50). Mixed numbers. Using a calculator.
Multiplying fractions	**8C:** Up to 3 fractions in the product, denominator no more than 12, can have mixed numbers and/or integers in the mix; products where cancelling can be done; using a calculator (denominators > 12)	**4B:** Up to 3 fractions in the product (includes exponents; ***can have two terms; can be negative***). Denominators no greater than 12. Can have mixed numbers and/or integers in the mix. Products where cancelling can be done. Using a calculator.	**1E:** 2 fractions in the product (includes exponents; can have two terms; can be negative). Denominators no greater than 12. Can have mixed numbers and/or integers in the mix. Products where cancelling can be done. Using a calculator.
BEDMAS and fractions			**1E:** BEDMAS expressions involving fractions. Using a calculator.
Reciprocals	**8D:** Finding the reciprocal of a fraction; using reciprocals to simplify products	**4B:** Finding the reciprocal of a fraction (***includes negatives***). Using reciprocals to simplify products.	
Dividing fractions	**8E:** Can have proper fractions, mixed numbers, integers. Denominator must be 12 or less.	**4B:** Can have proper fractions, mixed numbers, integers. Denominator must be 12 or less. ***BEDMAS expressions involving division with fractions.*** Using a calculator.	**1E:** Can have proper fractions, mixed numbers, integers. Denominator must be 12 or less. Using a calculator.
Fractions within fractions		**4B: '**Fractions' where the numerator and/or denominator is a sum or difference of fractions - simplify them.	
Problem solving	**8F:** Word problems based on any of the problem types specified above.	**4C:** Word problems based on any of the problem types specified above.	**1E:** Word problems based on addition, subtraction, multiplication, division of fractions.
The unitary method with fractions		**4D:** Given $\frac{n}{d}$ of an amount, find $\frac{1}{d}$ of that amount and/or the whole amount. Word problems based on the same thing.	
Square roots of fractions		**4E:** Proper fractions. Improper fractions. Mixed numbers. (Note: for all fractions, the numerator and denominator are perfect squares)	**9A:** Proper fractions (***numerator and denominator do not have to be perfect squares; use a calculator in this case***).
Decimals			
Constructing decimal numbers	**9A:** Written/oral form ↔ decimal form; place value tables; expanded form ↔ decimal form; stating the value of a particular digit; fraction form (denominator is a power of 10) ↔ decimal form.	**6A:** Expanded form ↔ decimal form; stating the value of a particular digit; fraction form (denominator is a power of 10) ↔ decimal form (***includes mixed numbers***).	**1F:** Expanded form ↔ decimal form. Stating the value of a particular digit.
Representing decimal numbers	**9B:** Using a 10×10 grid; using MABs		
Decimal currency	**9C:** Writing currency values (diagram featuring 'notes' and 'coins') as decimals of one dollar; words ↔ decimal form; converting cents to dollars.		
Using a number line	**9D:** Given a number line, find the value of the number N (up to 2 decimal places); mark a list of decimal numbers on a number line (up to 2 decimal places); reading measuring instruments (with a decimal scale).	**6B:** Given a number line, find the value of the number N (up to 2 decimal places, ***can have more than one place marked***). Mark a list of decimal numbers on a number line (up to 2 decimal places).	

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Ordering decimals	**9E:** Arranging in ascending/descending order (3 or 4 numbers, up to 3 decimal places each); comparing two decimals (using >, <, or =, and up to 3 d.p.); writing the next few terms in an arithmetic sequence of decimal numbers.	**6B:** Arranging in ascending or descending order (3 or 4 numbers, up to 3 decimal places each). ***Word problems requiring you to do this.*** Comparing two decimals (using >, <, or =, up to 3 d.p., ***may start with a fraction***).	
Rounding decimal numbers	**9F:** Rounding to 4 decimal places.	**6H:** Rounding to 4 decimal places. ***Word problems with the same parameters***.	**1F:** Rounding to 2 decimal places. Word problems with the same parameters.
Converting decimals to fractions	**9G:** Starting decimal can be up to 3 decimal places, with a whole number part from 0 to 10.	**6A:** Starting decimal can be up to 3 decimal places, with a whole number part from 0 to 10.	**1F:** Starting decimal can be up to ***4*** decimal places, with a whole number part from 0 to 10.
Converting fractions to decimals	**9H:** Starting fraction's denominator up to 1000, whole number part can be from 0 to 10. Emphasis is on multiplying to get a power of 10 as the denominator.		
Comparing sizes		**6I:** Given the size of two items, find how many times larger the first one is. Given the size of one item, and how many times larger the second item is, find the size of the second item.	
Problem Solving			
Trial and error	**10A:** Solving problems by trial and error.		
Making a list	**10B:** Solving problems by making a list.		
Modelling or drawing a picture	**10C:** Solving problems by making a model or drawing a		
Making a table and looking for a pattern	**10D:** Solving problems by making a table and looking for a pattern.		
Working backwards	**10E:** Solving problems by working backwards.	**16G:** Solving problems by working backwards.	
Problem solving by search		**16F:** Problem solving by search.	
Operations with decimals			
Adding and subtracting decimals	**11A:** Addition: Up to 4 numbers, maximum of 4 decimal places, whole number part of each number less than 100. Subtraction: up to 3 numbers, maximum of 3 decimal places, whole number part of each less than 100. Problems where the decimals are given in words (same parameters as above); problem solving based on the parameters given above	**6B:** Addition: Up to 4 numbers, maximum of 4 decimal places, whole number part of each number less than 100. Subtraction: up to 3 numbers, maximum of 3 decimal places, whole number part of each less than 100. Problem solving based on the parameters given above.	**1F:** Up to three numbers, maximum of 4 d.p., can have a mix of + and -.
Multiplying and dividing by powers of 10	**11B:** Finding the product or quotient; finding the missing power of 10	**6D:** Finding the product or quotient.	
Large decimal numbers	**11C:** Writing numbers as thousands, millions or billions (e.g. 1250000 = 1.25 million). Converting this form back to a normal number.		
Multiplying decimal numbers	**11D:** 'Straight' multiplying: 1 significant figure in each number of the product (can have one of the numbers with 2 s.f.), maximum of 3 decimal places, up to 3 numbers in the product. For anything more difficult, a 'whole number' product is given (e.g. "if 34 × 28 = 952, find 0.34 × 2.8."). Real-life problems based on these parameters.	**6E:** 'Straight' multiplying: 1 significant figure in each number of the product (can have one of the numbers with 2 s.f.), maximum of 3 decimal places, up to 3 numbers in the product. For anything more difficult, a 'whole number' product is given (e.g. "if 34 × 28 = 952, find 0.34 × 2.8"). Real-life problems based on these parameters.	**1F:** 'Straight' multiplying: 1 significant figure in each number of the product (can have one of the numbers with 2 s.f.), maximum of 3 decimal places, up to 3 numbers in the product.
Dividing decimals	**11E:** Divisor is always single-digit. Dividend is less than 100, with a maximum of 2 d.p. Some problems need padding with trailing zeros. Some problems have a recurring decimal as the answer.	**6F:** Problems with a single digit divisor (dividend is less than 100, with a ***maximum of 3 d.p.,*** some problems need padding with trailing zeros). Problems where the divisor is a decimal (same parameters for the dividend; divisor has a maximum of 4 decimal places).	**1F:** Can have integers or decimals as the divisor. If decimal points are removed, the dividend is a multiple of the divisor.

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Terminating and recurring decimals	**11F:** Terminating decimals: denominator of the starting fraction is a factor of 1000. Recurring decimals: denominator of the starting fraction is 12 or less. More complicated decimals: Starting fraction has denominator less than 200.	**6G:** Terminating decimals: denominator of the starting fraction is a factor of 1000. Recurring decimals: denominator of the starting fraction is 12 or less. More complicated decimals: Starting fraction has denominator less than 100.	**1F:** Combining terminating decimals, recurring decimals and ones requiring a calculator to solve.
Using a calculator	**11G:** Ordering a list of fractions (all denominators are 25 or less, all proper fractions); word problems like the ones above but with more/larger numbers.	**6F:** Word problems like the ones above but with more/larger numbers.	**1F:** Word problems using the parameters given above. ***BEDMAS expressions involving decimals.*** **1H:** ***BEDMAS expressions with decimals (including exponents).***
Measurement			
Units of measurement	**12A:** Selecting sensible units to measure length and mass of objects.	**9A:** Selecting sensible units to measure length of objects.	**10A:** Selecting sensible units to measure length of objects.
Reading scales	**12B:** Rulers, thermometers, fuel gauges, speedometers, bathroom scales, measuring jugs		
Length conversions	**12C:** Converting between km↔m↔cm↔mm. Converting lengths to the same units and then adding them or putting them in order.	**9A:** Converting between km ↔ m ↔cm ↔ mm. Converting lengths to the same units and then adding them or putting them in order. ***Word problems requiring conversion of units.***	**10A:** Converting between km ↔ m ↔cm ↔ mm. Converting lengths to the same units and then adding them or putting them in order. Word problems requiring conversion of units.
Perimeter	**12D:** Triangles, squares, rectangles, other shapes (all lengths are given in the same units). Word problems based on these parameters. Using a ruler to measure perimeter. **12G:** Word problems based on any of the problem types specified above.	**9B:** Triangles, squares, rectangles, other shapes (***lengths are not necessarily in the same units***). Word problems based on these parameters.	**10A:** Triangles, squares, rectangles, other shapes (lengths are not necessarily in the same units). Word problems based on these parameters. ***Calculate the perimeter of a shape, if the side lengths are all in terms of x.***
Scale diagrams	**12E:** Scale length → actual length (cm and m); actual length → scale length (cm and m); Given a scale diagram, find what the actual measurements are; given a rough sketch, re-draw the scale diagram accurately. **12G:** Word problems based on any of the problem types specified above.	**12F:** ***Writing a scale as a ratio and stating the scale factor. Given a ratio, interpret it as a scale (i.e., 1 cm represents...).*** Scale length → actual length (cm and m). Actual length → scale length (cm and m). ***Given a description, draw a scale diagram.*** Given a scale diagram, find what the actual measurements are.	**23A:** Given a rough sketch, re-draw the scale diagram accurately. ***Use the scale diagram to solve problems and obtain unknown lengths.***
Mass	**12F:** Converting between t ↔ kg ↔ g ↔ mg. Selecting sensible units to measure mass of objects. **12G:** Word problems based on any of the problem types specified above.	**12F:** Converting between t ↔ kg ↔ g ↔ mg. Selecting sensible units to measure mass of objects. ***Word problems based on mass.***	
The relationship between units		**11D:** Given the temperature and quantity of water, find its mass. Given the gsm of a particular type of paper and the quantity, find its mass.	
Error			
Directed Numbers			
Opposites	**13A:** Representing things with positive or negative numbers; stating the combined effect of up to 5 separate actions; finding differences between two directed numbers.		
Directed numbers and the number line	**13B:** Writing the opposite of a directed number; increase/decrease a number using a number line; finding out which of two numbers is larger/smaller; Using comparison operations (> and <) to describe the relationship between two numbers; plotting directed numbers on a number line; arranging a list of directed numbers in order; finding the halfway point between two directed numbers.	**3D:** Writing the opposite of a directed number. Increase/decrease a number using a number line. ***Finding the difference (using a number line) between two directed numbers.*** Plotting directed numbers on a number line. Finding the halfway point between two directed numbers.	

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Using a number line to add and subtract	**13C:** Up to four numbers in a problem, each number is no more than ±15, solution is between -10 and 10	**3D:** Up to four numbers in a problem, ***each number is no more than ±40***, ***numbers may be decimals (1 d.p.)*** solution is between ***-20 and 20***.	
Adding and subtracting negatives	**13D:** Up to four numbers in a problem, each number is either 1 or two digits. One question on finding the average temperature.	**3D:** Up to four numbers in a problem, each number is either 1 or 2 digits.	**1C:** Up to four numbers in a problem, each number is either 1 or 2 digits.
Multiplying directed numbers	**13E:** Up to three numbers in the product with at least one negative, each number is no more than ±12. Given the solution and a partial product, find the missing number. Products involving the square/cube of directed numbers. Powers of -1.	**3D:** Up to three numbers in the product with at least one negative, each number is no more than ±12. Products involving the square/cube of directed numbers.	**1C:** Up to three numbers in the product with at least one negative, each number is no more than ±12. Products involving the square/cube of directed numbers.
Dividing directed numbers	**13F:** Using both 'fraction' format and the ÷ sign. Ignoring any - signs, the first number is a multiple of the second (up to 12th multiple). Given a partial division problem and the solution, fill in the missing number.	**3D:** Using the ÷ sign. Ignoring any - signs, the first number is a multiple of the second (up to 12th multiple).	**1C:** Using both 'fraction' format and the ÷ sign. Ignoring any - signs, the first number is a multiple of the second (up to 12th multiple).
Combined operations	**13G:** BEDMAS using only the basic operations +, ×, ÷, −, and brackets (no nested brackets). 'Fractions' with expressions in numerator and or denominator (using only +, ×, −; maximum of two numerals). Word problems using these parameters.	**3D:** BEDMAS using the basic operations +, ×, ÷, −, exponents, and brackets (no nested brackets).	**1D:** BEDMAS using only the operations +, ×, ÷, −, exponents, and brackets (can have nested brackets).
Using your calculator	**13H:** Up to four numerals, maximum of four digits per numeral, answer must be an integer. Word problems involving these parameters.		**1D:** Up to ***six*** numerals, maximum of four digits per numeral, answer must be an integer.
Percentage			
Percentages	**14A:** Writing a shaded region of a square as a fraction out of 100, then as a percentage. Same thing for a number of symbols in a circle. Same thing for the numbers from 1 to 100.	**7A:** Writing a shaded region of a square as a fraction out of 100, then as a percentage.	
Converting fractions to percentages	**14B:** Writing the percentage represented by the shaded portion of a diagram. Fraction (out of 100) → percentage. Fraction → % (where the denominator is a factor of 100). Word problems using these parameters.	**7A, 7B:** Fraction → % (where the denominator is a factor of 100). ***Problems where the resulting % will be a mixed number (e.g. 2/9, 5/16)*** Word problems using these parameters.	**3A:** Fraction → % (where the denominator is a factor of 100).
Converting percentages to fractions	**14C:** Integer values up to 1000. Decimal values up to 100 (up to 2 d.p.)	**7B:** Integer values up to 1000. ***Mixed numbers (denominator 2, 3, 4 or 5)***.	**3A:** Integer values up to ***200***. Mixed numbers (denominator 2, 3, 4 or 5).
Converting decimals to percentages	**14D:** Up to 4 decimal places, whole number part of 0 or 1. Writing a fraction (denominator no more than 100) as a decimal then as a percentage.	**7A:** Decimal → fraction (out of 100) → percentage. **7B:** Up to 4 decimal places, ***whole number part up to 10***.	**3A:** Decimal (up to 3 d.p.) → percentage.
Converting percentages to decimals	**14E:** Integer values (up to 3 digits in length). Decimal values (maximum of 2 decimal places, whole number part up to 3 digits length). Fractions and mixed numbers (denominators 2, 4, and 5; whole number part if present can only be single-digit)	**7B:** Integer values (***up to 4 digits in length***). Decimal values (***1 d.p.***; whole number part up to 3 digits length).	**3A:** Integer values (up to 4 digits in length). Decimal values (***2 d.p.***; whole number part up to 3 digits length).
Plotting numbers on a number line	**14F:** Up to four numbers (written as %, decimal or fraction), convert all to percentages and place on a number line. Given numbers plotted on a number line, write them as fractions, as decimals and as %.		
Shaded regions of figures	**14G:** Dividing up a figure correctly. Shading the correct number of parts (or leaving the correct amount unshaded).	**7A:** Dividing up a figure correctly. Shading the correct number of parts. ***Word problems asking you to interpret shaded figures***.	
Time and Temperature			
Time lines	**15A:** Identifying the location of various points on the time line. Working out the length of time between events.		

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Units of time	**15B:** Converting between years ↔ months ↔ weeks ↔ days ↔ hours ↔ minutes ↔ seconds (including using 'compound' figures e.g. 34 hours 27 minutes). Adding up two/three times (all given in hours and minutes).	**11E:** Converting between years ↔ months ↔ weeks ↔ days ↔ hours ↔ minutes ↔ seconds (including using 'compound' figures e.g. 34 hours 27 minutes). ***Comparing two time periods (in different units) to see which is longer. Word problems using the above parameters.***	
Differences in time	**15C:** Working out the number of days between two dates. Given a time, find what the time was (hours and minutes) earlier/later. Working out the difference in hours and minutes between two times (including times on different days). Word problems using these parameters.	**11E:** Working out the difference in hours and minutes between two times (including times on different days). Word problems using these parameters. Given a time, find what the time was (hours and minutes) earlier/later.	
Reading clocks and watches	**15D:** 24-hour time ↔ 12-hour time ↔ analogue time. Identifying incorrectly written 24-hour times. Word problems involving 24-hour and 12-hour times.		
Timetables	**15E:** Deriving such information as number of services, the earliest/latest/highest/lowest value and when it occurs, distance/time between two different places.	**11E:** Deriving such information as number of services, the earliest/latest/highest/lowest value and when it occurs, distance/time between two different places.	
Time zones	**15F:** Given a time in one country, find the time in another country. Includes moving 'right' and 'left' across time zones, and going across the Prime Meridian or the International Date Line (so the days are different).	**15F:** Given a time in one country, find the time in another country. Includes moving 'right' and 'left' across time zones, and going across the Prime Meridian or the International Date Line (so the days are different). ***Word problems using these parameters***.	
Average speed	**15G:** Given two of (speed, distance, time), calculate the third quantity. Time may be given in hours (integers, fractions and decimals) or hours and minutes.	**22D:** Given two of (speed, distance, time), calculate the third quantity. Time may be given in hours (integers, fractions and decimals) or hours and minutes.	
Temperature conversions	**15H:** Fahrenheit ↔ Celsius, using either a graph or the	**17C:** Fahrenheit ↔ Celsius, using a graph.	
Using percentages			
Comparing quantities	**16A:** Express one quantity as a percentage of another quantity (using units of measurement, q1 < q2). Express a statement (e.g. 17 marks out of 20) as a percentage. Answers have a maximum of 1 decimal place (except where ⅓ is involved).	**7C:** Express one quantity as a percentage of another quantity (using units of measurement, ***can have the bigger quantity first***). Express a statement as a percentage. Word problems using these parameters.	**3A:** Express a statement as a percentage. Word problems using these parameters.
Finding percentages of quantities	**16B:** Integer percentage values (less than 100, answer can be given in different units). Comparing two quantities (one of which is a %) to see which is bigger/smaller. Word problems using these parameters.	**7D:** Integer, ***decimal, or mixed number*** percentage values (***less than 200***, answer can be given in different units). Word problems using these parameters.	**3C:** Integer, decimal, or mixed number percentage values (less than 100, answer can be given in different units). Word problems using these parameters.
The unitary method in percentage		**7E:** Given *n*% of an amount, find 100% of that amount (or some different %). Word problems based on the same thing.	**3B:** Given *n*% of an amount, find 100% of that amount (or some different %). Word problems based on the same thing.
Percentages and money	**16C:** Finding a % of a money amount (the percentage can have 0 or 1 d.p., and must be less than 100). Writing one amount as a percentage of another (amounts may be entirely in dollars, entirely in cents or a combination of the two).	**7C, 7D (some questions):** Finding a % of a money amount (the percentage can have 0 or 1 d.p., and must be less than 100). Writing one amount as a percentage of another (amounts may be entirely in dollars, entirely in cents or a combination of the two).	
Profit and loss	**16D:** Given cost price and selling price, find the profit/loss and the % profit/loss. Given the cost price and the % profit/loss (always an integer), find the selling price.	**7H:** Given cost price and selling price, find the profit/loss and the % profit/loss. Given the cost price and the % profit/loss (always an integer), find the selling price. Word problems based on these.	**3D:** Given cost price and selling price, find the profit/loss and the % profit/loss. Given the cost price and the % profit/loss (always an integer), find the selling price. Word problems based on these.
Discount	**16E:** Given the cost price and the % discount (generally 50 or less, may have a ½ or 0.5 on the end), find the selling price of the item.	**7H:** Given the cost price and the % discount (generally 50 or less, may have a ½ or 0.5 on the end), find the selling price of the item.	**3D:** Given the cost price and the % discount (generally 50 or less, may have a ½ or 0.5 on the end), find the selling price of the item. ***Given the cost price and the discounted price, find the % discount given.***

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Goods tax	**16F:** Given the cost price and the tax %, find the amount of tax that must be added on. Given the same information, find the total price of the item.		
Percentage increase or decrease		**7F:** Increase/decrease using two steps. Increase/decrease using a multiplier. Word problems involving % increase/decrease.	**3E:** Increase/decrease using a multiplier. Word problems involving % increase/decrease.
Finding a percentage change		**7G:** Given the start value and finish value, find the percentage change. Word problems based on this.	**3E:** Given the start value and finish value, find the percentage change. Word problems based on this.
Finding the original amount			**3F:** Given the % increase/decrease and the finishing amount, calculate the starting amount. Word problems based on this.
Simple interest	**16G:** Given the time, rate and borrowed amount, find the interest payable. Given the same information, find the total amount to repay.	**7I:** Given the time, rate and borrowed amount, find the interest payable. Given the same information, find the total amount to repay. ***Given the same information, find out what the monthly repayments would be***.	**7I:** Given the time, rate and borrowed amount, find the interest payable (***now using a formula, time can be in months***). Given the same information, find the total amount to repay. Given the same information, find out what the monthly repayments would be.
Compound interest			**3H:** Using a table, 1 row per year (use simple interest formula for each year and add on); using this to work out the total amount and/or the interest-only component. Using the compound interest formula to work out total amount and/or interest component.
Appreciation			
Depreciation			
Borrowing			
Foreign exchange			
Data collection and representation		**Statistics**	
Samples and populations	**17A:** Suggesting how to select a random sample in a situation. Identifying which number is the population and which is the sample. Estimating how many (or what %) of people/things have a particular characteristic, given the results of a sample and the population size.		**18A:** ***Given a graph, work out the sample size.*** **18D:** Given a scenario, identify which number is the population and which is the sample. ***Given a scenario, explain how the sampling method used would not produce a representative sample.***
Data collection		**20A:** Suggesting whether a census or a sample should be used. Identifying possible sources of bias in a sample/situation.	**18A:** Suggesting whether a census or a sample should be used. **18A, 18C:** Identifying possible sources of bias in a sample/situation.

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Categorical data	**17B:** Interpreting dot plots. Constructing dot plots (horizontal and vertical). Constructing a frequency table for a data set, and using it to answer questions. Finding the mode of a data set from a dot plot or frequency table.	**20B:** Constructing a frequency table for a data set, and using it to answer questions. ***Interpreting frequency tables.***	**5A:** Interpreting tabled information. **18A:** Identifying a variable as categorical (or numerical). Given a categorical variable, write down possible categories.
Graphs of categorical data	**17C:** Constructing column graphs and using them to answer questions. Interpreting column graphs. Constructing pie charts (where the sector angles are all integers), and using them to answer questions. Interpreting pie charts.	**20B:** Constructing column graphs and using them to answer questions. Interpreting column graphs. Constructing pie charts (where the sector angles are all integers), and using them to answer questions. Interpreting pie charts.	**5A:** Interpreting column graphs. Interpreting pie charts. Constructing pie charts (***working out the sector angle to the nearest degree***). **18A:** ***Given a graph, identify the dependent and independent variables.*** Constructing column graphs and using them to answer questions. Interpreting column graphs. Constructing pie charts (where the sector angles are all integers), and using them to answer questions. Interpreting pie charts. ***Calculating the appropriate sector angle for a category.***
Numerical (quantitiative) data	**17D:** Constructing stem-and-leaf plots (data set is either integers or 1 d.p. values, stems are not 'split'), and using them to answer questions (like mode, or 'what % were…')	**20C:** Constructing stem-and-leaf plots (data set is either integers or 1 d.p. values, stems are not 'split'), and using them to answer questions (like maximum/ minimum, or 'what % were…'). ***Constructing a frequency table for a numerical data set, and using it to answer questions. Interpreting a column graph of a set of numerical data.***	**18A:** ***Identifying a variable as numerical (or categorical). Classifying a variable as quantitative discrete or quantitative continuous.*** **20A:** Constructing column graphs /bar charts and using them to answer questions. Interpreting graphs. Identifying outliers. Describing the distribution of the data (symmetrical, positively/ negatively skewed).
Continuous numerical data, grouped continuous data			
Grouped discrete data			**20B:** Given a data list, construct a tally/frequency table. Given a data list, construct an ordered stem-and-leaf plot. Using these to answer questions about the data set. **20D:** Constructing back-to-back stem-and-leaf plots and using these to compare two data sets.
Mean or average (measures of centre)	**17E:** Given a list of values, find their mean (each number can have up to 3 digits). Using mean to compare performance (question in the text uses netball games and total goals scored).	**20D:** Given a list of values, find their mean (each number can have up to 3 digits). Using mean to compare performance. ***Given a list of values or a graph, calculate the median. Given a list of values or a graph, calculate the mode.***	**18A:** Finding the mode of the data from a graph. **20C:** Given a list of values, find their mean (each number can have up to 3 digits). Given a list of values, a graph ***or a frequency table***, calculate the median. Given a list of values, a graph ***or a frequency table***, calculate the mode. Using these to interpret data.
Two-way tables (comparing categorical data)			**18B:** Given a partially complete two-way table, complete it and use it to calculate percentage frequencies.
Comparing and reporting categorical data			**18C:** Given a table of data, use it to construct side-by-side column graphs or back-to-back bar charts. Using these to answer questions/interpret the data.
Misleading graphs			**18E:** Given a graph, identify any misleading or poor features.
Measuring the spread of data			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Box-and-whisker plots			
Cumulative frequency			
Standard deviation			
The normal distribution			
Algebra and patterns			
Patterns	**18A:** Given the first three figures in a matchstick pattern: work out the next few patterns, fill out a table of values, and work out a rule connecting the number of matchsticks to the figure number.	**5A:** Given the first three figures in a matchstick pattern: work out the next few patterns, fill out a table of values, and work out a rule connecting the number of matchsticks to the figure number.	
Variables and notation	**18B:** Using product notation (omitting the ×). Given a rule in words, write it in algebraic form (using proper product notation).	**8D:** Using product notation (omitting the ×). Writing algebraic expressions in index form. Writing algebraic expressions in expanded form.	**2A:** Using product notation (omitting the ×). Writing algebraic expressions in index form. Writing algebraic expressions in expanded form. **2G:** ***Writing algebraic products in simplest form (one or two letters per term, may have a coefficient, can also have constants).***
Key words in algebra		**8B:** Identifying how many terms an expression has. Identifying the coefficient of a variable. Identifying constant terms. Identifying like terms.	**2B:** Identifying how many terms an expression has. Identifying the coefficient of a variable. Identifying constant terms. Identifying like terms.
Simplifying expressions		**8C:** Simplifying an expression containing a sum of individual letters (it may have all letters the same, or two different letters). Simplifying an expression containing like terms (one letter per term, may have a coefficient, can also have constants).	**2F:** Simplifying an expression containing like terms (one ***or two letters*** per term, may have a coefficient, can also have constants).
Algebraic form	**18C:** Given a statement in words, write it using the appropriate letters and symbols (+, ×, ÷, −) - maximum of two operations, use letters and numbers up to 100. Word problems involving these parameters.	**8A:** Given a statement in words ***or a collection of symbols,*** write it using the appropriate letters and symbols (***emphasis here is on building expressions to represent totals***). Word problems involving these parameters. **16A:** Given a statement in words, write it using the appropriate letters and symbols (+, ×, ÷, −) - maximum of two operations, use letters and numbers up to 100. ***Given an expression/equation in n, re-write it in sentence form.***	**2C, 11A:** Given a statement in words, write it using the appropriate letters and symbols (+, ×, ÷ or fraction bar, −); ***can include average, exponents, two or more operations***. Given an expression/equation in *n*, re-write it in sentence form. **11B:** Given a statement in words, translate it into a linear equation.
Generalising arithmetic			**2D:** Given a basic arithmetic calculation, write a generalised form using algebra. Word problems involving these.

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
The value of an expression	**18D:** Given an algebraic expression in terms of *x* and a value for *x,* find the value of the expression (maximum of three operations in the expression).	**5B:** Given a rule and a set of inputs, find the corresponding outputs. ***Given a rule and a set of outputs, find the corresponding inputs. Given the inputs and their corresponding outputs, find the rule connecting them***. **8A, 8E:** Given an algebraic expression with ***1 or more variables*** and the value of each variable, find the value of the expression (***exponents, brackets, negative numbers OK***).	**2E:** Given an algebraic expression with 1 or more variables and the value of each variable, find the value of the expression (exponents, brackets, negative numbers OK).
Substituting into formulae, practical problems using formulae	**18E:** Using a formula (maximum of two operations from +, ×, ÷, −; single digit numbers only) to fill out a table of values. Given a formula in *x* and *y* (maximum of three operations, one set of brackets allowed) and a list of *x* values, find the corresponding *y* values. Word problems based on these parameters. Matchstick pattern problems where you find the rule and then use it to find out how many matchsticks are needed for the ...th figure.	**5A:** Matchstick pattern problems where you find the rule and then use it to find out how many matchsticks are needed for the ...th figure. **5C:** Using a formula (maximum of two operations from +, ×, ÷, −; single digit numbers only) to fill out a table of values. Given a formula in x and y (maximum of three operations, one set of brackets allowed) and a list of *x* values, find the corresponding y values. **5C, 5D:** Word problems based on these parameters.	**11D:** Given a formula and all but one of the values, calculate the unknown value.
Rearranging formulae			
Constructing formulae		**5E:** Given a fixed amount and an amount per …, find a formula, then use it to work out values (e.g. tradesmen on the job).	
Formulae by induction/ Number patterns and rules			
Linear graphs	**18G:** Given an 'input' number, use a supplied linear graph to find the corresponding 'output' number. Given an 'output' number, use a supplied linear graph to find the corresponding 'input' number.	**17F:** ***Create a linear graph.*** Given an 'input' number, ***use the graph you've created*** to find the corresponding 'output' number. Given an 'output' number, ***use the graph*** to find the corresponding 'input' number.	
Number sequences		**5F:** Given the start of a number sequence, state the next … terms and give the rule used to find the next member (arithmetic and geometric sequences only). Given the first number and a rule, generate the next … terms in the sequence. Given a number pattern (with one missing), find the missing number. **6C:** Given the start of a number sequence, state the next … terms (using decimals).	
Recurrence relationships			
Area, volume and capacity			
Area	**19A:** Given a shape made up of squares, find the shape's area (in square units), and the perimeter (in units). Selecting sensible units to measure the area of various objects. Problems involving a cost per square metre, and calculating	**9C:** Given a shape made up of squares, find the shape's area (in square units)	**10C:** Selecting sensible units to measure the area of various objects.
Conversion of area units	**19B:** Converting between $km^2 \leftrightarrow ha \leftrightarrow m^2 \leftrightarrow cm^2 \leftrightarrow mm^2$.	**9C:** Converting between $km^2 \leftrightarrow ha \leftrightarrow m^2 \leftrightarrow cm^2 \leftrightarrow mm^2$. ***Word problems asking you to compare areas of regions.***	**10C:** Converting between $km^2 \leftrightarrow ha \leftrightarrow m^2 \leftrightarrow cm^2 \leftrightarrow mm^2$.

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
The area of a rectangle	**19C:** Given a rectangle with its side lengths, find the area. Find all possible rectangles with integer-length sides that have an area/perimeter of… **19G:** Word problems using the above parameters.	**9D:** Given a rectangle with its side lengths, find the area. Word problems involving these parameters (particularly with calculations involving a cost per m^2).	**10C:** Given a rectangle with its side lengths, find the area. Word problems involving these parameters (particularly with calculations involving a cost per m^2).
The area of a triangle	**19D:** Given the base and height of a triangle, find its area. **19G:** Word problems using these parameters.	**9D:** Given the base and height of a triangle, find its area. Word problems using these parameters.	**10C:** Given the base and height of a triangle, find its area. Word problems using these parameters.
The area of parallelograms		**9D:** Given the base and height of a parallelogram find its area. Word problems using these parameters.	**10C:** Given the base and height of a parallelogram find its area. Word problems using these parameters.
The area of trapezia		**9D:** Given the lengths of the parallel sides and the distance between them, find the area. Word problems using these parameters.	**10C:** Given the lengths of the parallel sides and the distance between them, find the area. Word problems using these parameters.
The area of compound shapes	**19C:** Given a compound shape (using only rectangles and/or rectangle cut-outs) and the required side lengths, find the area. Given a compound shape involving rectangles and triangles (and given all needed lengths), find the area. **19G:** Word problems involving these parameters.	**19C:** Given a compound shape (***using rectangles, triangles, parallelograms, trapezia***) and the required side lengths, find the area. Word problems involving these parameters.	**10E:** Given a compound shape (***using rectangles, triangles, parallelograms, trapezia***) and the required side lengths, find the area (***including giving the area in terms of x***). Word problems involving these parameters.
Volume	**19E:** Converting between $m^3 \leftrightarrow cm^3 \leftrightarrow mm^3$. Finding the volume of a prism (given area of base and length). Given a solid made of unit blocks, find the solid's volume (in cubic units). Volume of a rectangular prism (given length, width and depth). Volume of a triangular prism (given triangle dimensions and prism length). All dimensions for a prism are in the same units (no mixing), and generally integers (although can have 1 d.p.) **19G:** Word problems using the above parameters.	**11A:** Given a solid made of unit blocks, find the solid's volume (in cubic units). Selecting sensible units for measuring the volume of various objects. Converting between $m^3 \leftrightarrow cm^3 \leftrightarrow mm^3$. **11B:** Finding the volume of a prism (given area of base and length). Volume of a rectangular prism (given length, width and depth). Volume of a triangular prism (given triangle dimensions and prism length). Word problems using these parameters. ***Lengths aren't necessarily given in the same units!***	**12A:** Selecting sensible units for measuring the volume of various objects. Converting between $m^3 \leftrightarrow cm^3 \leftrightarrow mm^3$. **12B:** Finding the volume (given appropriate dimensions) of prisms, cones, pyramids.
Capacity	**19F:** Selecting sensible units for measuring the capacity of various objects. Converting between mL ↔ L ↔ kL. Converting between units of volume and units of capacity. Given a solid of uniform cross-section and its dimensions (or the end area and length), find the solid's capacity. **19G:** Word problems using the above parameters.	**11C:** Selecting sensible units for measuring the capacity of various objects. Converting between mL ↔ L ↔ kL. Converting between units of volume and units of capacity. Given a solid of uniform cross-section and its dimensions (or the end area and length), find the solid's capacity. Word problems using the above parameters.	**12C:** Selecting sensible units for measuring the capacity of various objects. Converting between mL ↔ L ↔ kL. Converting between units of volume and units of capacity. Given a solid of uniform cross-section and its dimensions (or the end area and length), find the solid's capacity. Word problems using the above parameters.
Linear equations/inequations			
What are equations?	**20A:** Distinguishing between equations and expressions. Given a statement in words, write it as an equation involving *x*. Given an equation (using only +, ×, ÷, −) with one number blanked out, determine the number that fits (integers only, and usually less than 20).	**8B:** Distinguishing between equations and expressions.	**2B:** Distinguishing between equations and expressions.
Solving simple equations	**20B:** Solving by inspection (one-step equations only, answer is always an integer, numbers involved are generally 200 or less). Solving by trial and error where possible answers are given (two-step equations, integer coefficients/constants less than 50). Solving by trial and error (same parameters, but no possible solutions provided).	**13A:** Solving by inspection (one-step equations only, answer is always an integer, numbers involved are generally 200 or less). Solving by trial and error where possible answers are given (***possible solution set has a greater concentration of negative numbers***; two-step equations, integer coefficients/constants less than 50). ***Given an equation state whether it is true for one value of x, all values or no values. Stating whether an equation is an identity.***	**6A:** Solving by trial and error where possible answers are given (two-step equations, integer coefficients/constants less than 50). Given an equation state whether it is true for one value of x, all values or no values.
Maintaining balance	**20C:** Given a set of scales with objects on each side, find the relationship between the different objects. Given a set of scales with objects on each side, and more objects being added/removed from one side, state what has to happen to the other side to maintain balance. Find the equation which results from applying an operation (+, ×, ÷, −) to both sides (maximum of two 'steps' in the starting equation, all numbers involved are 30 or less)	**13B:** Find the equation which results from applying an operation (+, ×, ÷, −) to both sides (maximum of two 'steps' in the starting equation, all numbers involved are ***50 or less***).	**6B:** Find the equation which results from applying an operation (+, ×, ÷, −) to both sides (maximum of two 'steps' in the starting equation, all numbers involved are 50 or less).

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Inverse operations	**20D:** Stating the inverse of a given operation. Given an expression that involves an operation and its inverse, simplify it. Solving one-step equations using an inverse operation (integer answers, can be negative).	**13C:** Stating the inverse of a given operation. Given an expression that involves an operation and its inverse, simplify it. Solving one-step equations using an inverse operation (integer answers, can be negative).	
Using flowcharts	**20E:** Given a flowchart with operations and a starting number, complete the flowchart (maximum of two operations). Given a flowchart and what each 'stage' looks like, fill in the missing operations (maximum of 2). Given an expression, construct a flowchart showing how to 'build up' and 'undo' it.	**13D:** Given an expression, construct a flowchart showing how to 'build up' and 'undo' it.	**6C:** Given an expression, construct a flowchart showing how to 'build up' from x. ***Explain how to isolate x, given an expression in x.***
Solving equations	**20E:** Solving equations by isolating the unknown (two-step equations, may involve negative numbers).	**13E:** Solving equations by isolating the unknown (***2 and 3-step equations***, may involve negative numbers).	**6D:** Solving equations by isolating the unknown (2 and 3-step equations, may involve negative numbers ***and fractions***).
Equations with a repeated unknown		**13F:** Equations where there are like terms. Equations that require expanding/simplifying (can have brackets on one or both sides). Equations with *x* on both sides.	**6E:** Equations that require expanding/simplifying (can have brackets on one or both sides). Equations with *x* on both sides.
Fractional equations			**6F:** Integers in the denominator (no greater than 10). One or two fractions on the LHS, one only on the RHS. Numerators are expressions in *x*.
Unknown in the denominator			**6G:** One or all denominators are expressions in *x*. Numerators can be integers, or expressions in x also (must always simplify to a linear equation - no quadratics).
Problem solving with equations	**20F:** Word problems based on (or combining) any of the problem types specified above.	**16C:** Given the perimeter/area of a shape, set up an equation and solve for *x* (or find the dimensions of the shape). **16D:** Problems involving money. **16E:** A mix of the problems from 16A through 16D.	**11C:** Word problems based on (or combining) any of the problem types specified above.
Linear inequations			**11E:** Given a sentence, write it as a mathematical inequation. Given an inequation, draw it on a number line.
Solving linear inequations			**11F:** One-step inequations. Two-step inequations. Inequations involving fractions. Inequations involving brackets. Inequations with the unknown on the RHS. Inequations with the unknown on both sides.
Sign diagrams			
The arithmetic mean-geometric mean inequality			
Coordinates and lines			
The number plane	**21A:** Plotting points on a set of axes (integer coordinates, can be positive or negative). Identify which quadrant a point lies in. 'Connect the dot' problems (with negative coordinates in the mix).		**13A:** Plotting points on a set of axes (integer coordinates, can be positive or negative). ***Given a set of axes with points plotted on it, state the coordinates of the points.*** Identify which quadrant a point lies in.
Points on a straight line	**21B:** Given the equation of a line and an *x*-coordinate, find the corresponding *y*-coordinate (can have fractional coordinates with denominator 2, 4, or 5; also coordinates with 1 decimal place).		**13B:** Given a graph linking two variables, and the value of one variable, find the value of the other variable.

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Graphing straight lines	**21C:** Given an equation complete a table of values and draw the graph. Given a table of values, find the x and y intercepts. Given a partially complete table of values, fill in the remaining values and work out the equation.	**17F:** Given an equation complete a table of values and draw the graph.	**13B, 13C:** Given an equation complete a table of values and draw the graph. ***Starting to look at the idea of gradient.***
The equation of a line			**13D:** State in words the meaning of an equation (connecting x and y). Given a table of values, find the equation of the straight line that passes through the points.
Gradient or slope			**13E:** Given a line on grid paper, give its gradient. Be able to draw a line on grid paper with a specified gradient. Given the coordinates of two points, plot them and hence work out the gradient of the line connecting them. Use the gradient formula to work out the gradient of the line connecting two points.
Parallel and perpendicular lines			
Using gradients			
Graphing lines from equations			**13F:** Given an equation, find the gradient and y-intercept, and hence sketch the graph.
The **general form** of a straight line, $Ax + By = C$			**13G:** Finding the gradient of a line in general form. Drawing the graph of a line in general form (using axes intercepts).
Special lines	**21D:** Identifying and drawing horizontal/vertical lines from the equation. Investigating the lines $y = x$ and $y = -x$.		**13G:** Identifying and drawing horizontal/vertical lines from the equation. Investigating the lines $y = x$ and $y = -x$.
The x- and y-intercepts	**21E:** Given an equation, find the x- and y-intercepts. Given an equation, find the axes intercepts and draw the graph using them.		**13F:** Given an equation, find the axes intercepts and draw the graph using them.
Finding equations from graphs			**13H:** Given a graph, find the gradient and y-intercept, and hence the equation of the line. Given a graph, find the rule connecting the variables.
Finding the equation of a line			
Does a point lie on the line?			**13I:** Given an equation and a coordinate pair, work out whether the point lies on the line.
The distance between two points			
Midpoints			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Using coordinate geometry			
Distance from a point to a line			
Transformations			
Reflections and line symmetry	**22A:** Given half an image, draw the other half as a mirror reflection. Given some geometrical shape drawn on grid paper and a mirror line (all on grid paper), draw the image. Given a figure, draw in any lines of symmetry (or say that it has none!).		**16B:** Given half an image, draw the other half as a mirror reflection (***image can cross the mirror line***). Given some geometrical shape drawn on grid paper and a mirror line (all on grid paper), draw the image (***image can cross the mirror line***). Given a figure, draw in any lines of symmetry (or say that it has none!).
Rotations and rotational symmetry	**22B:** Given a starting figure on grid paper, a centre of rotation and an angle of rotation, draw the rotated object. Given a starting object and its rotation, give the angle of rotation (multiples of 90° only). Given a diagram, find the centre of rotational symmetry. Given a diagram, find the order of rotational symmetry.		**16C:** Given a starting figure (may or may not be on grid paper), a centre of rotation and an angle of rotation, draw the rotated object. Given a diagram, find the centre of rotational symmetry. Given a diagram, find the order of rotational symmetry. Draw a figure that has an order of rotational symmetry of ...
Translations	**22C:** Given a starting figure on grid paper, and the required translation (horizontal and/or vertical), draw the translated figure. Given the starting figure and the translated figure, give the translation.		**16A:** Given a starting figure on grid paper, and the required translation (horizontal and/or vertical), draw the translated figure. Given the starting figure and the translated figure, give the translation. ***Calculating the distance moved under a given translation.***
Enlargements and reductions	**22D:** Given a starting object and the enlarged/reduced image, find the scale factor (scale factor is generally one of 2, 3, 4, ½, ⅓, ¼). Given a starting object and the scale factor, draw the enlarged/reduced image (same parameters).		**16D:** ***Given the object and its image, state whether an enlargement or a reduction was used.*** Given a starting object and the enlarged/reduced image, find the scale factor.
Tessellations	**22E:** Given a shape, draw the tessellation (can be drawn on a grid; doesn't have to be).		
Similar figures			**16E:** Given two similar figures, find the unknown side length. Given two shapes, state whether or not they are similar.
Similar triangles			**16F:** Given a figure with two similar triangles, state why the triangles are similar (i.e., each pair of angles is equal because…). Given a figure with similar triangles, establish that the triangles ARE similar and hence determine the unknown side length. Problem solving based on this.
Areas and volumes of similar objects			**16G:** Given two similar shapes (and their areas), find the unknown length/area/volume. Given the dimensions or area of two similar shapes, find the scale factor. Word problems based on these.
Congruent figures			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Congruence of triangles			**16H:** Given two triangles, state whether or not they are congruent (and give reasons - use one of the tests). Deductive geometry problems based on this.
The midpoint theorem			
Sets			
Sets and their members	**23A:** Listing all the members of a given set. Stating whether an item is a member of a specified set. Given a set, state how many elements it contains. Given two sets, say whether or not they are equal. Stating whether one set is a subset of another. Given a set, list particular subsets.	**21A:** Listing all the members of a given set. Given a set, state how many elements it contains. Stating whether an item is a member of a specified set. Stating whether one set is a subset of another. Given a set, list particular subsets.	
Complement of a set		**21B:** Given a universal set *U* and a subset, find the complement of the subset (elements may be listed for you, or you may have to list them yourself).	
The intersection of sets	**23B:** Given two sets (elements already listed), work out their intersection. Given the description in words of two sets, work out the elements in each set and thus work out the intersection set.	**21C:** Given two sets (elements already listed), work out their intersection. Given the description in words of two sets, work out the elements in each set and thus work out the intersection set.	
The union of sets	**23C:** Given two sets (elements already listed), work out their union. Given the description in words of two sets, work out the elements in each set and thus work out the union set.	**21C:** Given two sets (elements already listed), work out their union. Given the description in words of two sets, work out the elements in each set and thus work out the union set.	
Disjoint sets		**21D:** Given two sets, state whether or not they are disjoint. Given disjoint sets, be able to interpret what that means.	
Special number sets			
Set builder notation, interval notation, square bracket notation			
Venn diagrams	**23D:** Given a universal set *U*, and sets *A* and *B* which are subsets of *U*, find their union, find their intersection, and illustrate the sets on a Venn diagram (might need to list the elements first). Given a blank Venn diagram, shade the region(s) corresponding to a given statement. Given a partly shaded Venn diagram, describe the shaded region in words. Word problems using the above parameters.	**21E:** Given a universal set *U*, and sets *A* and/or *B* which are subsets of *U,* illustrate the sets on a Venn diagram (might need to list the elements first). ***Matching a Venn diagram to a particular configuration of sets.*** Given a blank Venn diagram, shade the region(s) corresponding to a given statement. Given a partly shaded Venn diagram, describe the shaded region in words. **21F:** Word problems using the above parameters.	
The algebra of sets			
Finding probabilities from Venn diagrams		**21G:** Given the appropriate information, place it on a Venn diagram, and/or use the Venn diagram to calculate probabilities.	
Solids and polyhedra			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Types of solids	**24A:** Drawing diagrams to represent various solids. Naming the solid which best represents a given real-life object (e.g. a basketball → sphere). Given a diagram of a solid, name it. Naming or counting the faces/edges/ vertices of a polyhedron.	**15A:** Drawing diagrams to represent various solids. Naming the solid which best represents a given real-life object (e.g. a basketball → sphere). Naming or counting the faces/edges/ vertices of a polyhedron.	
Freehand drawings of solids	**24B:** Rectangular prisms (with or without given dimensions); pyramids; cylinders (may or may not be given diameter/length); cones (may or may not be given base diameter and height). One question on sketching a sphere.	**15A:** Rectangular prisms; pyramids; cylinders; cones.	
Isometric projections	**24C:** Given an oblique drawing of a 'block solid', draw its isometric projection.	**15C:** Given an oblique drawing of a 'block solid', draw its isometric projection. ***Given an isometric projection, draw the oblique projection. Use isometric paper to re-create a given figure.***	
Constructing block solids	**24D:** Given the isometric projection, draw its top/front/back/ left/right views. Given the top/front/back/left/right views, draw the corresponding isometric projection.	**15D:** Given the isometric projection, draw its top/front/back/ left/right views. Given the top/front/back/left/right views draw the corresponding isometric projection.	
Nets of solids	**24E:** Matching nets with the corresponding diagram and/or name. Assembling solids from a net. (Note: this uses only prisms, pyramids, cones and cylinders.)	**15B:** Matching nets with the corresponding diagram and/or name. Assembling solids from a net. (Note: this uses only prisms, pyramids, cones and cylinders.) ***Drawing the net for a solid (rectangular prisms, pyramids only).***	
Surface area			**10F:** Cubes, prisms, cylinders, spheres, compound solids.
Algebraic expansion and factorisation			
The Distributive Law		**10A:** One term (can be a letter, number or a combination; no exponents) outside the brackets, up to three terms inside the brackets.	**4A:** One term (can be ***letters,*** a number or a combination; ***can have exponents***) outside the brackets, up to three terms inside the brackets.
Simplifying algebraic expressions		**10B:** Expanding and then simplifying by collecting like terms (can have two brackets to expand or just one).	**4A:** Expanding and then simplifying by collecting like terms (can have two brackets to expand or just one).
Brackets with negative coefficients		**10C:** One **negative** term (can be a letter, number or a combination; no exponents) outside the brackets, two inside the brackets. Expanding expressions involving these, then collecting like terms.	**4A:** One **negative** term (can be ***letters,*** a number or a combination; ***can have exponents***) outside the brackets, two inside the brackets. Expanding expressions involving these, then collecting like terms.
The product $(a + b)(c + d)$		**10D:** Problems with just letters. Problems with a combination of single letters and numbers (which then need simplifying).	**4B:** Problems with a combination of single letters and numbers (which then need simplifying). ***One set of brackets, all squared.*** **4C:** ***Using the 'FOIL' rule.***
Perfect Squares expansion			**4C:** Using the Perfect Squares expansion rule. Expanding expressions involving these, then collecting like terms.
Difference of Two Squares expansion			**4C:** Using the Difference of Two Squares expansion rule. Expanding expressions involving this, then collecting like terms.
Further expansion			**4B:** Two terms in one bracket, three terms in the other. Expressions that have a number out the front, e.g., $3(x + 4)(x + 5)$.
Binomial expansion			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Geometric applications		**10E:** Writing expressions for the perimeters of polygons (don't have to be regular). Writing expressions for the areas of polygons (rectangles, triangles, and compound shapes involving these).	
Factorisation of algebraic expressions		**10F:** Given a partial factorisation, write the missing factor. Finding the HCF of two terms. Factorising by taking out a common factor (two or three terms; the 'common factor' may be an expression in brackets).	**17A:** Given a partial factorisation, write the missing factor. Finding the HCF of two terms (***including powers of pronumerals, and brackets***). **17B:** Factorising by taking out a common factor (two or three terms; the 'common factor' may be an expression in brackets).
Difference of Two Squares (DOTS) factorising			**17C:** Using the DOTS rule to factorise expressions. Factorising using a common factor and then using DOTS. Using DOTS where one of the squares is an expression in brackets.
Perfect Squares factorisation			**17D:** Given a partial expression, identify the missing term that makes it a perfect square. Given a perfect square (coefficient of x^2 is 1), factorise it. Given an algebraic expression, factorise using common factors and then using perfect squares. Given a perfect square (coefficient of x^2 is not 1), factorise it.
Factorising quadratic trinomials			**17E:** Finding two numbers with a particular sum, and a particular product. Given a suitable quadratic trinomial, factorise it using this method. Given an algebraic expression, factorise using common factors and then using this method.
Factorisation of $ax^2 + bx + c$, $a \neq 1$			
Ratio			
Ratio		**12A:** Expressing two quantities as a ratio (units are the same). Expressing two quantities as a ratio (units are different and need to be converted). Word problems using these	**1G:** Expressing two quantities as a ratio (units are the same). Expressing two quantities as a ratio (units are different and need to be converted). Word problems using these
Writing ratios as fractions		**12B:** Given a diagram, find the ratio of shaded area to unshaded area (or total area), and find what fraction of the whole the shading represents. Using information from pie charts/column graphs and writing a ratio.	
Equal ratios		**12C:** Writing ratios in simplest form (integers). Writing ratios in simplest form (fractions/mixed numbers with denominator 2, 3, 4, or 5). Writing ratios in simplest form (decimals, up to 2 d.p.). Given a diagram featuring a number of objects, express the situation as a ratio in simplest form. Given two quantities (not necessarily the same units), write as a ratio in simplest form. Given two pairs of ratios, state whether or not they are equal.	**1G:** Writing ratios in simplest form (integers). Writing ratios in simplest form (fractions/mixed numbers with denominator 2, 3, 4, or 5). Writing ratios in simplest form (decimals, up to 2 d.p.).
Proportions		**12D:** Given two equal ratios (where one of the numbers is blanked out), find the missing number. Given one of two quantities (e.g., weights of two different foodstuffs) and their ratio, find the other quantity. Word problems using these parameters.	**1G:** Given two equal ratios (where one of the numbers is blanked out), find the missing number. Given one of two quantities (e.g., weights of two different foodstuffs) and their ratio, find the other quantity (word problems).
The unitary method for ratios			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Using ratios to divide quantities		**12E:** Given a line segment and a point on it, state the ratio in which the point divides the line segment. Given the ratio of a mixture and how much of the mixture **in total** is required, find how much of a component is needed. Word problems involving these parameters.	**1G:** ***Given an amount and a ratio, divide the amount in that ratio (e.g., divide $50 in the ratio 1:4).*** Given the ratio of a mixture and how much of the mixture **in total** is required, find how much of a component is needed. Word problems involving these parameters.
Gradient or slope		**12G:** Given a series of slopes, state which one is steepest (sight judgement only). Given the rise and run of a slope, find the rise : run ratio.	
Line Graphs			
Properties of line graphs		**17A:** Given a graph, state the independent and dependent variables. Given a graph, state whether it is increasing, decreasing, or increasing in some sections and decreasing in others. Given a table of values, identify the dependent and independent variables, draw a point graph, and identify whether the graph is increasing or decreasing.	
Estimating from line graphs		**17B:** Given a graph, estimate things like the initial value, the value at a particular time, when the maximum or minimum occurred…	**5C:** Be able to match the line graph to the story.
Conversion graphs		**17C:** Currency exchange (both directions). Also temperature conversions.	
Travel graphs		**17D:** Given a graph, estimate (for example) the time taken for the trip, when certain events occurred, the distance of the trip, the distance travelled after a certain period of time…	**5B:** Given a graph, estimate (for example) the time taken for the trip, when certain events occurred, the distance of the trip, the distance travelled after a certain period of time…
Continuous and discrete graphs		**17E:** Completing a table of values, graphing the points, stating whether the points are collinear, giving a rule connecting the variables, stating whether the points should be joined, using the graph to determine values.	**13A:** Graphing the points, stating whether the points are collinear, giving a rule connecting the variables. **13B:** Stating whether or not the relationship between variables is linear. Stating whether it is sensible to join points with a straight line.
Using technology to draw graphs			**5D:** Using technology to draw pie charts, bar graphs and column graphs.
Time series data			
Step graphs			
Circles			
Parts of a circle		**18A:** Identifying diameter, radius, arc (major and minor), semicircle, chord, segment (major and minor), sector, and tangent on a diagram, and being able to draw them as	
Circumference		**18B:** Given the radius, find the circumference. Given the diameter, find the circumference. Word problems involving these. Finding the perimeter of shapes involving parts of circles. Given the circumference of a circle, find its diameter/radius.	**10B:** Given the radius, find the circumference. Given the diameter, find the circumference. Word problems involving these. Finding the perimeter of shapes involving parts of circles. Given the circumference of a circle, find its diameter/radius. ***Finding a formula for the perimeter of a shape involving circles or parts of circles.***

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Area of a circle (or ellipse)		**18C:** Given the radius/diameter, calculate the area of a circle (or a part of a circle). Finding the area of compound shapes involving circles. Word problems involving these.	**10D:** Given the radius/diameter, calculate the area of a circle (or a part of a circle). Word problems involving these. ***Calculate the area of an ellipse (or part ellipse).*** **10E:** Finding the area of compound shapes involving circles ***(including giving the area in terms of x).***
Cylinders		**18D:** Finding the volume of a cylinder. Finding the capacity of a cylinder. Word problems involving these (including finding the height, given the base diameter and the volume/capacity).	**12B:** Finding the volume of a cylinder. Finding the capacity of a cylinder. **12C, 12D:** Word problems involving these.
Spheres			**12B:** Finding the volume of a sphere (or a part sphere). **12C, 12D:** Word problems involving these.
Chance/Probability			
Describing chance		**19A:** Describe using a word/phrase the chance of various events happening.	
Assigning numbers to chance		**19B:** Using the numbers 0 (for impossible), 1 (for certain), and 0.5 (for equally likely).	
Experimental probability		**19C:** Using the results of a survey to estimate the probability of events. Given a data set, calculate the frequency/relative frequency of each outcome, and estimate the probability of each outcome happening.	**15A:** Using the results of a survey/experiment to estimate the probability of events. **15B:** Given a data set, calculate the frequency/relative frequency of each outcome, and estimate the probability of each outcome happening.
Probabilities from two-way tables			**15C:** Given a partially completed two-way table, complete it and use it to estimate probabilities.
Listing possible outcomes (sample spaces)		**19D:** Sample space: Listing all the possible outcomes of an experiment.	**22A:** Sample space: Listing all the possible outcomes of an experiment.
Theoretical probability		**19E:** Using the (number of outcomes in that event) ÷ (total number of outcomes) formula for single events. For compound events (where each outcome is equally likely), listing all the possible outcomes and then using the formula.	**22B:** Using the (number of outcomes in that event) ÷ (total number of outcomes) formula for single events. For compound events (where each outcome is equally likely), listing all the possible outcomes and then using the formula. ***Calculating the probability of complementary events.***
Using grids to find probabilities			**22C:** Using a two-dimensional grid to list the sample space, and use it to calculate probabilities.
Multiplying probabilities (independent events)			**22D:** Given the individual probabilities of two independent events, multiplying their probabilities to find the probability of **both** occurring.
Tree diagrams		**19F:** Using a tree diagram to illustrate/list the possible outcomes of compound events (up to three 'stages' in the tree). Using this to calculate the probability of particular events.	**22E:** Using a tree diagram to illustrate/list the possible outcomes of compound events (up to three 'stages' in the tree). Using this to calculate the probability of particular events ***(this time, each 'branch' is labelled with the probability)***.
Binomial probabilities			
Making probability generators		**19G:** Designing a spinner and/or a die that will give particular theoretical probabilities. Other generators include a dartboard, and a hat with marbles in it.	

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Expectation			**22F:** Given the probability of a particular event occurring, and the number of times an experiment is conducted, find the number of times that event is expected to occur.
Odds			**22G:** Given the odds of a particular event happening, calculate the probability of that event occurring. Given the odds and the money invested, calculate the payout.
Life tables			
Mutually exclusive and non-mutually exclusive events			
Rates			
Rates		**22A:** Given a rate, write down what it means. Given two quantities, work out the rate.	
Comparing prices		**22B:** Given two different sizes of the same product and their prices, calculate the unit cost and hence state which is better value for money.	
Using rates		**22C:** Given a rate and one of the quantities in that rate, use it to calculate the other quantity. Given a graph, calculate the rate and use it to calculate other values.	
Density		**22E:** Given two of (density, volume, mass) calculate the third quantity. Mass may be given in kg or g, volume may need to be calculated (dimensions given in cm and/or m).	
Converting rates		**22F:** Given a rate, convert the rate so it uses different units (e.g., converting a rate in km/h to m/s).	
Algebraic Fractions			
Simplifying algebraic fractions		**22A:** Given a fraction with algebraic products in the numerator and denominator, simplify the fraction.	**2G, 8A, 21B:** Given a fraction with algebraic products in the numerator and denominator, simplify the fraction.
Multiplying algebraic fractions		**22B:** Up to 3 fractions, each fraction has a letter/number/algebraic product in the numerator and denominator.	**21C:** Up to 3 fractions ***(including squared and cubed fractions),*** each fraction has a letter/number/algebraic product in the numerator and denominator.
Dividing algebraic fractions		**22C:** Two fractions (or a fraction and an integer), each fraction has a letter/number/algebraic product in the numerator and denominator.	**21C:** Two fractions (or a fraction and an integer), each fraction has a letter/number/algebraic product in the numerator and denominator.
Adding and subtracting algebraic fractions		**22D:** Adding/subtracting two fractions (or a fraction and an integer); each fraction has a letter/number/ algebraic product in the numerator and denominator. Adding/subtracting two fractions (or a fraction and an integer); one or both fractions has an algebraic expression (e.g., $x + 2$) in the numerator.	**21D:** Adding/subtracting two fractions (or a fraction and an integer); each fraction has a letter/number/ algebraic product in the numerator and denominator. Adding/subtracting two fractions (or a fraction and an integer); one or both fractions has an algebraic expression (e.g., $x + 2$) in the numerator.
Factorising then simplifying algebraic fractions			**21E:** Given an algebraic fraction, factorise numerator and/or denominator using common factors, then cancel. Algebraic fractions where the numerator and/or denominator is a quadratic.

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Evaluating algebraic fractions			**21A:** Given an algebraic fraction and the value of each unknown, evaluate the fraction.
Surds and Pythagoras			
Radicals on a number line			
Rules for square roots			**9B:** Using the rule $\left(\sqrt{a}\right)^2 \leftrightarrow a$. Using the rule $\sqrt{a} \times \sqrt{b} \leftrightarrow \sqrt{ab}$. Using the rule $\frac{\sqrt{a}}{\sqrt{b}} \leftrightarrow \sqrt{\frac{a}{b}}$. Writing a surd in simplest form, e.g., $\sqrt{24} = 2\sqrt{6}$.
Expansion of surd expressions			**4D:** Using the rule $\sqrt{a} \times \sqrt{a} = a$. Collecting 'like surds', e.g., $5\sqrt{2} + 4\sqrt{2} = 9\sqrt{2}$ (up to four terms).
The Distributive Law			**4D:** Using the distributive law with surd expressions.
The product $(a + b)(c + d)$			**4D:** Using the 'FOIL' rule to expand/simplify surd expressions.
Perfect Squares expansion			**4D:** Using the Perfect Squares expansion rule to expand/simplify surd expressions.
Difference of Two Squares expansion			**4D:** Using the Difference of Two Squares expansion rule to expand/simplify surd expressions.
Division by radicals			
Solving equations of the form $x^2 = k$			**9C:** Equations with the x^2 on one side and a number on the other. Equations where x^2 has something added to/subtracted from it. Equations where you need to divide both sides by an integer. Equations where you need to collect like terms (and then divide).
Equality of surds			
The theorem of Pythagoras			**9D:** Calculating the length of the hypotenuse (includes sides with surd lengths). Calculating the length of a shorter side (including sides with surd lengths). Compound shapes involving right-angled triangles.
Problem solving using Pythagoras' Theorem			**9G:** Problem solving using these parameters. **9H:** Three dimensional problems.
The converse of Pythagoras' Theorem			**9E:** Given a triangle with three side lengths (can be surds), work out whether or not it is right angled, and/or indicate where the right angle is. **9G:** Problem solving using these parameters. **9H:** Three dimensional problems.
Pythagorean triples			**9F:** Given a set of three numbers, state whether or not they are a Pythagorean triple. Given two numbers, calculate the third number so that a Pythagorean triple is formed.

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Indices			
Algebraic products and quotients in index notation			**8A:** Simplifying algebraic products (numbers then letters in index form). Simplifying algebraic terms that have been raised to another power, e.g. $(2a^2)^2$. **8B:** Given a fraction with algebraic products in the numerator and denominator, simplify the fraction.
Index laws			**8B:** Multiplying → add indices. Dividing → subtract indices. Raising a power to another power → multiply indices.
Expansion laws			**8C:** Products to a power → raise each number and/or letter to that power. 'Fractions' to a power → raise numerator and denominator to that power.
Zero and negative indices			**8D:** Anything to the power of 0 → 1 (including expressions that simplify down to the power of 0). Negative indices: $a^{-n} \leftrightarrow \frac{1}{a^n}$ (including fractions, algebraic products to a negative power). Writing numbers as a power of 2, 3, or 5 (using negative indices if necessary).
Scientific notation (standard form)			**8E:** Writing numbers as powers of 10 (including negative indices where necessary). Scientific notation ↔ ordinary decimals. Word problems involving this. Simplifying a product of numbers in scientific notation. Using a calculator.
Exponential equations			
Expansion and factorisation with exponents			
Rational (fractional) Indices			
Logarithms			
Simultaneous Equations			
Trial and error solution			**14A:** Using a table to find the simultaneous solution of an equation pair. Given an equation pair and a potential solution to test, determine whether the potential solution 'fits'. Given an equation pair, find the simultaneous solution by trial and error.
Graphical solution			**14B:** Given an equation pair, draw their graphs on the same set of axes and hence find the point of intersection (simultaneous solution). Special cases: parallel lines,

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Solution by substitution			**14C:** Given an equation pair in the form $y = \ldots$, equate the right hand sides of each equation to find x. Then use that value to find the corresponding y. Given an equation pair where ONE of the equations has the form $x = \ldots$ or $y = \ldots$, use substitution to find the simultaneous solution.
Solution by elimination			**14D:** Given an equation, write down the equation that results if it is multiplied by some constant. Given an equation pair, write down the equation that results when the two are added vertically. Given an equation pair, find the simultaneous solution using the elimination method.
Problem solving with simultaneous equations			**14E:** Problem solving using the above methods.
Solving non-linear simultaneous equations			
Solving simultaneous equations using technology			
Quadratic Equations			
The Null Factor law			**19A:** Given a simple algebraic equation which has a product on one side and 0 on the other, use the Null Factor Law to deduce that at least one of the variables must be 0. Given an equation of the same form in x (including expressions in brackets multiplied together), solve for x.
Equations of the form $ax^2 + bx = 0$			**19B:** Given an equation of the form $ax^2 + bx = 0$, factorise the LHS and thus solve for x. Given an equation with unknowns appearing on both sides, collect like terms (making the RHS = 0), factorise the LHS and solve.
Solving equations using 'Difference of Two Squares' (DOTS)			**19C:** Using the DOTS rule to factorise, and then solve. Equations where one must first take out a common factor before using the DOTS rule. Equations where the answer will be a fraction/mixed number.
Solving equations of the form $ax^2 + bx + c = 0$			**19D:** Factorising using the 'splitting the x-term' method, then solving for the unknown (may require taking out a common factor first). Given an equation with unknowns appearing on both sides, expand, collect like terms (making the RHS = 0), factorise the LHS and solve.
Completing the square			
Problem solving with quadratic equations			**19E:** Given a 'word problem', translate it into a quadratic equation and solve.
Simultaneous equations involving quadratics			**19F:** Given an equation pair (where one of the equations is a quadratic) substitute one into the other and solve for x, then solve for y.
Solving harder equations using technology			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
The quadratic formula			
Trigonometry			
Trigonometry			**23B:** Given a right angled triangle and one of the other angles, label the sides as hypotenuse (H), opposite (O) or adjacent (A). Using a unit circle diagram to find the sine, cosine and tangent of angles between 0° and 90°.
The trigonometric ratios			**23C:** Given a right angled triangle with two unknown sides and one of the angles, set up an equation using one of the trigonometric ratios. Given a right angled triangle, a side and an angle, calculate the length of the unknown side using a suitable ratio. Given a right angled triangle and two sides, calculate the unknown angle using a suitable ratio.
Problem solving with trigonometry			**23D:** Problem solving based on the question types encountered in 23C.
Introduction to networks			
Network diagrams			**24A:** Given a network diagram, state the number of vertices/edges/arcs. Given a network diagram, name the vertices/edges/arcs. Name the paths going between two points. Be able to state what the vertices/edges in a network diagram represent.
Constructing networks			**24B:** Given a diagram of a house (with rooms and doorways marked), construct the corresponding network diagram. Given a series of network diagrams, identify which ones are topologically equivalent. Given a set of specifications for a network diagram, draw the network diagram.
Precedence networks			**24C:** Given a list of tasks (and their prerequisites), construct the precedence network.
Counting pathways			**24D:** Given a network diagram, count the number of pathways from one point to another (by labelling vertices). Count the number of pathways from one point to another, given that you **have to go through** some third point. Count the number of pathways from one point to another, given that you **must not go through** some third point.
Shortest path			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Shortest connection problems (minimum spanning tree)			
Chinese Postman problem			
Travelling Salesman problem			
Isomorphism and adjacency matrices			
Directed networks			
Locus			
Everyday applications of loci			**25A:** Given a scenario, draw the locus/shade the region that applies.
Locus in geometry			**25B:** Drawing the locus of all points that are … away from a fixed point. Drawing the locus of all points that are … away from a line segment. Drawing the locus of all points equidistant from A and B (or … from A and … from B).
Circles			
Ellipses			
Other locus problems			
Matrices			
Matrix size and construction			
Matrix equality			

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Addition and subtraction of matrices			
Scalar multiplication			
Matrix multiplication			
The determinant of a matrix			
Multiplicative identity and inverse matrices			
Simultaneous equations (and matrices)			
Linear transformations			
Proofs with 2×2 matrices			
Matrices using technology			
Quadratic Functions			
Quadratic functions			
Graphs of quadratic functions			
Using transformations to sketch quadratics			
Graphing by completing the square			
Axes intercepts			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Quadratic graphs			
Maximum and minimum values of quadratics (quadratic modelling, quadratic optimisation)			
Other functions: their graphs and uses			
Exponential functions			
Graphing simple exponential functions			
Growth problems			
Decay problems			
Simple rational functions			
Optimisation with rational functions			
Unfamiliar functions			
Vectors			
Vector representation			
Lengths of vectors			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Equal vectors			
Vector addition			
Scalar multiplication			
Vector subtraction			
The direction of a vector			
Problem solving by vector addition			
Vector equations			
Parallelism of vectors			
The scalar product of two vectors			
Vector proof			
Non-right angled triangle trigonometry			
Obtuse angles			
Area of a triangle using sine			
The sine rule			
The cosine rule			
Problem solving with the sine and cosine rules			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Trigonometric identities			
Variation			
Direct variation			
Inverse variation			
Two variable analysis			
Correlation			
Pearson's correlation coefficient, *r*			
Line of best fit by eye			
Linear regression			
Logic			
Propositions			
Compound statements			
Constructing truth tables			
Functions			
Mappings			

	Mathematics for the International Student 6 (MYP1)	**Mathematics for the International Student 7 (MYP2)**	**Mathematics for the International Student 8 (MYP3)**
Functions			
Function notation			
Composite functions			
Transforming $y = f(x)$			
Inverse functions			
The modulus function			
Advanced trigonometry			
Radian measure			
Trigonometric ratios from the unit circle			
Multiples of 30° and 45°			
Graphing trigonometric functions			
Modelling with sine functions			
Trigonometric equations			
Negative and complementary angle formulae			
Addition formulae			
Introduction to calculus			
Estimating gradients of tangents to curves			

	Mathematics for the International Student 6 (MYP1)	Mathematics for the International Student 7 (MYP2)	Mathematics for the International Student 8 (MYP3)
Gradients using quadratic theory			
Gradients using limit theory			
Differentiation			
Optimisation			
Areas under curves			
Integration			
The definite integral			
Counting and Probability			
The product and sum principles			
Counting permutations			
Factorial notation			
Counting with combinations			
Probabilities using permutations and combinations			
The hypergeometric distribution			

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Number Systems			
Different number systems			
The Hindu-Arabic system			
Big numbers			
Operations with whole numbers			
Adding and subtracting whole numbers			
Multiplying and dividing whole numbers			
Two step problem solving			
Number lines			
Rounding numbers		**4A:** Rounding off to the nearest 10/100… (up to 100000). **4F:** Rounding to 2/3/4 significant figures.	
Estimation and approximation		**4C:** One figure approximations. Word problems using this.	
Rounding money		**4B:** Given a monetary amount, round to the nearest 5 cents. Word problems involving this. Rounding to the nearest whole unit of currency.	
Rounding time		**4G:** Converting a 'decimal' time period into hours/minutes/seconds, and vice versa.	
Points, Lines and Angles			
Points and lines			
Angles			

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Angles at a point or on a line	**24A:** Angles in a right angle. Angles on a straight line. Angles in a revolution (includes multiple instances of the same unknown).	**21A:** Angles in a right angle. Angles on a straight line. Angles in a revolution (includes multiple instances of the same unknown).	
Angles of a triangle	**24A:** Finding unknown angles in a triangle (using angle sum = 180°; can have the unknown appearing more than once). Finding unknown angles in a triangle (using exterior angle of triangle; can have unknown appearing more than once). Finding the unknown angles in a figure using triangles, with these theorems.	**21B:** Finding unknown angles in a triangle (using angle sum = 180°). Finding unknown angles in a triangle (using exterior angle of triangle). Given the angles of a triangle, state which side is the longest. Finding the unknown angles in a figure using triangles, with these theorems.	
Angles of a quadrilateral	**24A:** One unknown. Multiple instances of the same unknown.	**21A:** One unknown. Multiple instances of the same unknown.	
Bisecting angles, geometric construction			
Angle pairs			
Parallel lines	**24A:** Finding the unknown angle, given a diagram involving parallel lines.	**21A:** Finding the unknown angle, given a diagram involving parallel lines. Given a diagram not drawn to scale, work out whether a pair of parallel lines is present.	
Location			
Map references			
Number grids			
Interpreting points on a grid		**20A:** Point graphs, comparing points	
Bearings and directions	**12E:** True bearings; given a diagram find the bearing of one point from another. ***Word problems involving these (you may need to use trigonometry to find unknown angles/sides).***	**16G:** True bearings; given a diagram find the bearing of one point from another. Word problems involving these (you may need to use trigonometry to find unknown angles/sides).	**10B:** True bearings; given a diagram find the bearing of one point from another. Word problems involving these (you may need to use trigonometry to find unknown angles/sides).
Number Properties			
Addition and subtraction			
Multiplication and division			
Zero and one			

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Index or exponent notation		**2C:** Writing products in index notation (single product, up to three different numbers). Writing a product of 'index numbers' (up to 4 of them) in natural number form. ***Negative bases. Using your calculator.***	
Order of operations			
Powers with base 10			
Squares and cubes			
Factors of natural numbers			
Divisibility tests			
Prime and composite numbers		**2C:** Writing a number in exponent form with some integer as a base. Writing as a product of prime factors in index form (up to 4-digit numbers).	
Multiples and LCM			
Fractions			
Representing fractions			
Fractions of regular shapes			
Equal fractions			
Simplifying fractions			
Fractions of quantities			
Comparing fraction sizes			

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Improper fractions and mixed numbers			
Polygons and plane geometry			
Polygons			
Triangles			**6B:** Constructing a triangle (using compass and ruler, given three sides).
Angles of isosceles triangles	**24A:** Finding unknown sides and angles using the properties of isosceles triangles.	**21C:** Finding unknown sides and angles using the properties of isosceles triangles.	
Quadrilaterals	**24A:** Finding unknown lengths or angles (using properties of quadrilaterals).	**21D:** Finding unknown lengths or angles (using properties of quadrilaterals).	
Angles of a polygon	**24A:** Finding unknown angles in a polygon (using angle sum formula; can have the unknown appearing more than once).	**21E:** Finding unknown angles in a polygon (using angle sum formula; can have the unknown appearing more than once). ***Word problems involving these.*** **21F:** Finding unknown angles in a polygon (exterior angles).	
Deductive geometry			
Circle theorems	**24B:** Angle in a semicircle, chords of a circle, radius-tangent, tangents to an external point - using these to find unknown lengths or angles. Word problems involving these (need to draw a diagram first!)		**21A:** Angle in a semicircle, chords of a circle, radius-tangent, tangents to an external point - using these to find unknown lengths or angles. Word problems involving these (need to draw a diagram first!) **21B:** Angle at the centre, angles subtended by the same arc, angle between a tangent and a chord. **21C:** Geometric proof using circle theorems.
Cyclic quadrilaterals			**21D:** Opposite angles of a cyclic quadrilateral are supplementary (use this in conjunction with other theorems). Testing to see if a quadrilateral is cyclic. Word problems involving these.
Euler's rule for plane figures	**24G:** Given two of (edges, regions, vertices), find the third value; using that information to draw a possible figure.		
Fraction Operations			
Adding fractions		**2B:** Same denominator. Different denominators (LCD up to 50). Mixed numbers. Can start with negative fractions. Using a calculator.	
Subtracting fractions		**2B:** Same denominator. Different denominators (LCD up to 50). Mixed numbers. Can start with negative fractions. Can have negative answers. Using a calculator.	
Multiplying fractions		**2B:** Up to 3 fractions in the product (includes exponents; can have two terms; can be negative). Denominators no greater than 12. Can have mixed numbers and/or integers in the mix. Products where cancelling can be done. Using a calculator.	

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
BEDMAS and fractions			
Reciprocals			
Dividing fractions			
Fractions within fractions			
Problem solving		**2B:** Word problems based on adding, subtracting, multiplying or dividing fractions.	
The unitary method with fractions			
Square roots of fractions	**4B:** Mixed Numbers.		
Decimals			
Constructing decimal numbers		**8A:** Expanded form ↔ decimal form.	
Representing decimal numbers			
Decimal currency			
Using a number line			
Ordering decimals			
Rounding decimal numbers		**4D:** Rounding (up to 4 d.p.). Word problems with the same parameters.	
Converting decimals to fractions			
Converting fractions to decimals			
Comparing sizes			
Problem Solving			
Trial and error			
Making a list			
Modelling or drawing a picture			
Making a table and looking for a pattern			

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Working backwards			
Problem solving by search			
Operations with decimals			
Adding and subtracting decimals		**8A:** Up to three numbers, maximum of 4 d.p., can have a mix of + and -.	
Multiplying and dividing by powers of 10			
Large decimal numbers			
Multiplying decimal numbers		**8A:** Maximum of 3 decimal places, up to 3 numbers in the product.	
Dividing decimals		**8A:** Can have integers or decimals as the divisor.	
Terminating and recurring decimals			
Using a calculator		**8A:** BEDMAS expressions with decimals (including exponents). Word problems using these.	
Measurement			
Units of measurement		**1B:** Selecting sensible units to measure length of objects.	
Reading scales		**1A:** Rulers, thermometers, fuel gauges, speedometers, bathroom scales, measuring jugs, ***electricity meters***.	
Length conversions	**7B:** ***Estimating the length of objects (and then checking them)***. Converting between km ↔ m ↔cm ↔ mm. Word problems requiring conversion of units.	**1B:** Converting between km↔m↔cm↔mm (***including using non-standard prefixes***). Converting lengths to the same units and then adding them or putting them in order. Estimating the lengths of objects (and then checking them). Word problems involving these.	
Perimeter	**7B:** Triangles, squares, rectangles, other shapes (lengths are not necessarily in the same units). Word problems based on these parameters. Calculate the perimeter of a shape, if the side lengths are all in terms of ***some unknown.***	**7A:** Using a ruler to measure perimeter. Finding the perimeters of triangles, quadrilaterals, other shapes (lengths are not necessarily in the same units). Word problems based on these parameters.	

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Scale Diagrams	**12A:** Given a rough sketch, re-draw the scale diagram accurately. Use the scale diagram to solve problems and obtain unknown lengths.	**12F:** Scale length → actual length (cm and m). Actual length → scale length (cm and m). Given a description, draw a scale diagram. Given the scaled length and actual length, work out the scale of the diagram.	
Mass		**1B, 1G:** Converting between t ↔ kg ↔ g ↔ mg (***including using non-standard prefixes***). Selecting sensible units to measure mass of objects. Word problems involving these.	
The relationship between units			
Error	**7A:** Finding the absolute error in a measurement. Finding the percentage error in a measurement. Stating the accuracy of a measurement.		
Directed Numbers			
Opposites			
Directed numbers and the number line			
Using a number line to add and subtract			
Adding and subtracting negatives		**2A:** Up to four numbers in a problem, each number is either 1 or 2 digits.	
Multiplying directed numbers		**2A:** Up to three numbers in the product with at least one negative, each number is no more than ±12. Products involving the square/cube of directed numbers.	
Dividing directed numbers		**2A:** Using the ÷ sign. Ignoring any - signs, the first number is a multiple of the second (up to 12th multiple).	
Combined operations		**2A:** BEDMAS using only the basic operations +, ×, ÷, −, exponents, and brackets (no nested brackets).	
Using your calculator		**2A:** Up to four numerals, maximum of four digits per numeral, answer must be an integer. Word problems involving these parameters.	
Percentage			
Percentages			

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Converting fractions to percentages		**8B:** Fraction → % (where the denominator is a factor of 100).	
Converting percentages to fractions		**8B:** Integer values up to ***250***. Mixed numbers (denominator 2, 3, 4 or 5).	
Converting decimals to percentages		**8B:** Decimal (up to 3 d.p.) → percentage.	
Converting percentages to decimals		**8B:** Integer values (up to 3 digits in length). Decimal values. Mixed numbers (denominator 2, 3, 4 or 5).	
Plotting numbers on a number line			
Shaded regions of figures			
Time and Temperature			
Time lines			
Units of time		**1G:** Converting between years ↔ months ↔ weeks ↔ days ↔ hours ↔ minutes ↔ seconds (including using 'compound' times e.g., 34 hours 27 minutes). Adding ***or subtracting*** two/three times (all given in hours and minutes).	
Differences in time		**1G:** Calculating the difference in hours and minutes between two times. Word problems using these parameters. Given a time, find what the time was (hours and minutes) earlier/later.	
Reading clocks and watches		**1H:** 24-hour time ↔ 12-hour time. Word problems involving 24-hour and 12-hour times.	
Timetables			
Time zones			
Average speed			
Temperature conversions			
Using percentages			
Comparing quantities		**8C:** Express a statement as a percentage. Word problems using these parameters.	

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Finding percentages of quantities		**8C:** Integer, decimal, or mixed number percentage values (less than 100, answer can be given in different units). Word problems using these parameters.	
The unitary method in percentage		**8D:** Given *n*% of an amount, find 100% of that amount (or some different %). Word problems based on the same thing.	
Percentages and money			
Profit and loss		**23A:** Given cost price and selling price, find the profit/loss. Given the cost price and the % profit/loss (always an integer), find the selling price. Word problems based on these. **23B:** Given cost price and selling price, find the % profit/loss. Word problems based on these.	
Discount		**23B:** Given the cost price and the % discount, find the selling price of the item. Given the cost price and the discounted price, find the % discount given.	
Goods tax	**11A:** Given the cost price and the tax %, find the amount of tax that must be added on. Given the same information, find the total price of the item.		
Percentage increase or decrease	**11A:** Increase/decrease using a multiplier. ***Multiplier ↔ % increase or decrease.***Word problems involving % increase/decrease. ***Using more than one multiplier to solve a problem.***	**8E:** Increase/decrease using two steps. Word problems involving % increase/decrease. **23D:** Increase/decrease using a multiplier. Multiplier ↔ % increase or decrease. Word problems involving % increase/decrease. **23E:** Using more than one multiplier to solve a problem.	
Finding a percentage change	**11A:** Given the start value and finish value, find the percentage change. Word problems based on this.		
Finding the original amount			
Simple interest		**23F:** Given the time, rate and borrowed amount, find the interest payable. Given the same information, find the total amount to repay. Given the same information, find out how long it would take to get the desired amount of interest. Given the same information, find out what monthly repayments would be.	
Compound interest	**11C:** Using a table, 1 row per year (use simple interest formula for each year and add on); using this to work out the total amount and/or the interest-only component. Using the compound interest formula to work out total amount and/or interest component. ***Using the compound interest formula to work out present value (PV) needed to generate a desired future value (FV). Finding the annual rate of increase.***	**11C:** Using a table, 1 row per year (use simple interest formula for each year and add on); using this to work out the total amount and/or the interest-only component.	**16E:** Using a table, 1 row per year (use simple interest formula for each year and add on); using this to work out the total amount and/or the interest-only component. Using the compound interest formula to work out total amount and/or interest component. Using the compound interest formula to work out present value (PV) needed to generate a desired future value (FV). Finding the annual rate of increase.
Appreciation	**11B:** Given the current price/value of something and the inflation rates (or % increases/decreases) for each year, find its future price/value.	**23E:** Given the current price/value of something and the inflation rates (or % increases/decreases) for each year, find its future price/value.	
Depreciation	**11D:** Using a table, 1 row per year; using this to work out the book value of an item after … years, or the depreciation that can be claimed. Using the depreciation formula to work out the book value, and/or the amount of depreciation.		**16F:** Using a table, 1 row per year; using this to work out the book value of an item after … years, or the depreciation that can be claimed. Using the depreciation formula to work out the book value, and/or the amount of depreciation.

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Borrowing	**11E:** Credit cards: Given the balance, the interest rate and the number of days, calculate the interest owing. Buying on terms: calculating the total cost and the interest component. Personal loans: setting up a table to determine the number of repayments to be made and the final repayment. Using a table of repayments to work this out.		
Foreign exchange		**23H:** Buying another currency using the 'selling rate'. Converting foreign currency back to 'your' currency using the	
Data collection and representation			**Univariate Data Analysis**
Samples and populations			
Data collection		**10A:** Suggesting whether a census or a sample should be used. Identifying possible sources of bias in a sample/situation (or stating whether or not a sample could be biased). ***Finding out whether the sample size is big enough in a given scenario.***	**8A:** Suggesting whether a census or a sample should be used. Identifying possible sources of bias in a sample/situation (or stating whether or not a sample could be biased). Finding out whether the sample size is big enough in a given scenario.
Categorical data	**9A:** Classifying a variable as categorical, discrete numerical or continuous numerical. Constructing column graphs /bar charts and using them to answer questions.	**10A:** Classifying a variable as categorical or numerical (discrete numerical or continuous numerical). Given a categorical variable, write down possible categories.	**8A:** Classifying a variable as categorical or numerical (quantitative discrete or quantitative continuous). Given a categorical variable, write down possible categories.
Graphs of categorical data		**10A:** Constructing column graphs, pie charts or bar graphs and using them to answer questions. Given a graph, identify the dependent and independent variables.	**8A:** Constructing column graphs, pie charts or bar graphs and using them to answer questions. Given a graph or table, identify the dependent and independent variables.
Numerical (quantitative) data	**9A:** Classifying a variable as categorical, discrete numerical or continuous numerical. Constructing column graphs /bar charts/***dot plots*** and using them to answer questions. Describing the distribution of the data (symmetrical, positively/ negatively skewed).	**10B:** Classifying a variable as discrete numerical or continuous numerical. Constructing column graphs/bar charts/dot plots and using them to answer questions. Describing the distribution of the data (symmetrical, positively/ negatively skewed)	**8B:** Classifying a numerical variable as quantitative discrete or quantitative continuous. Constructing column graphs/bar charts/dot plots and using them to interpret data. Describing the distribution of the data (symmetrical, positively/negatively skewed).
Continuous numerical data, grouped continuous data	**9B, 9F:** Explain why a particular variable is a continuous variable. Given a frequency table, construct a histogram. Use this to answer questions about the data set. Given a histogram, use it to answer questions about the data set.	**10D:** Explain why a particular variable is a continuous variable. Given a frequency table, construct a histogram (or you may be given a histogram); use this to answer questions about the data set. ***Given a data set, state whether a column graph or a histogram should be used.***	**8D:** Explain why a particular variable is a continuous variable. Given a frequency table, construct a histogram; use this to answer questions about the data set. Given a data set, state whether a column graph or a histogram should be used (***and draw the graph***).
Grouped discrete data	**9B:** Given a data list, construct an ordered stem-and-leaf plot. Use this to answer questions about the data set. **14A:** Comparing back-to-back ***bar charts (or side-by side column graphs)*** and using these to compare two data sets.	**10C:** Given a data list, construct a tally and frequency table. Given a data set, construct an ordered stem-and-leaf plot. Use this to answer questions about the data set.	**8C:** Given a data list, construct a tally and frequency table. Given a data set, construct an ordered stem-and-leaf plot. Use this to answer questions about the data set.
Mean or average (measures of centre)	**9C:** Given a data list, find their mean (each number can have up to 3 digits). Given a data list, a graph or a frequency table, calculate the median. Given a data list, a graph or a frequency table, calculate the mode ***or modal class***. Using these to interpret data.	**10A:** Given a graph, find the mode of the data. **10D:** Given a data list or a frequency table, calculate the modal class. **10E:** Given a data list, a graph or a frequency table, find the mean and median. Word problems involving these.	**8A:** Given a graph, find the mode of the data. **8E:** Given a data list or a frequency table, calculate the mode or modal class. Given a data list, a graph or a frequency table, find the mean and median. Word problems involving these.

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Two-way tables (comparing categorical data)			
Comparing and reporting categorical data			
Misleading graphs			
Measuring the spread of data	**9D:** Calculating quartiles, range and interquartile range (IQR) (data may be in a list, in a table or in a stem-and-leaf plot). **9F:** Estimating the median and quartiles from a frequency histogram or table (continuous data).	**10G:** Calculating quartiles, range and interquartile range (IQR) (data may be in a list, in a table or in a stem-and-leaf plot).	**8G:** Calculating quartiles, range and interquartile range (IQR) (data may be in a list, in a table or in a stem-and-leaf plot).
Box-and-whisker plots	**9E:** Given a boxplot, find the five-number summary/ range/IQR. Given the five-number summary, draw the boxplot. Using a boxplot to answer questions about the data. Using a boxplot to comment on the data's distribution. Calculating the upper and lower boundaries for outliers, and using these to identify outliers in the data set. **14B:** Constructing parallel boxplots, using them to compare two sets of data.	**10B:** Judging outliers by eye. **10H:** Given a boxplot, find the five-number summary/range/IQR. Given the five-number summary, draw the boxplot. Using a boxplot to answer questions about the data. Using a boxplot to comment on the data's distribution. Constructing parallel boxplots, using them to compare two sets of data. **10I:** Using a calculator/technology to solve these problem types.	**8H:** Given a boxplot, find the five-number summary/range/IQR. Given the five-number summary (or having found it for a data set), draw the boxplot. Using a boxplot to answer questions about the data. Using a boxplot to comment on the data's distribution. Constructing parallel boxplots, using them to compare two sets of data. **8I:** Using a calculator/technology to solve these problem types.
Cumulative frequency	**9G:** Constructing a cumulative frequency table. Using this to draw a cumulative frequency graph. Using the graph to answer questions about the data.	**10F:** Constructing a cumulative frequency table. Using this to draw a cumulative frequency graph. Using the graph to answer questions about the data.	**8F:** Constructing a cumulative frequency table. Using this to draw a cumulative frequency graph. Using the graph to answer questions about the data (including finding the median).
Standard deviation			**8J:** Given a data list or graph, find the standard deviation (SD). Comparing SD to range and IQR. Looking at the effects of outliers on SD. Finding the SD of grouped data (requires you to estimate the mean).
The normal distribution			**8K:** Given the mean and SD for a data set, use these to correctly label a blank 'bell curve'. Using this to estimate probabilities.
Algebra and patterns			
Patterns			
Variables and notation	**3B:** Writing algebraic products in simplest form (one or two letters per term, may have a coefficient, can also have constants).	**9B:** Using product notation (omitting the ×). Writing algebraic expressions in index form. Writing algebraic expressions in expanded form. Writing algebraic products in simplest form (one or two letters per term, may have a coefficient, can also have constants).	
Key words in algebra			
Simplifying expressions	**3A:** Simplifying an expression containing like terms (one or two letters per term, may have a coefficient, can also have constants, ***now using different powers of the same unknown***).	**9A:** Simplifying an expression containing like terms (one or two letters per term, may have a coefficient, can also have constants).	
Algebraic form	**1A:** Given an expression/equation, re-write it in words ***(can use squares, roots)***. Given a statement in words, write it using the appropriate letters and symbols (can include average, exponents, two or more operations, ***reciprocals, square roots; can be an expression or an equation***)	**6A, 6C:** Given a statement in words, write it using the appropriate letters and symbols (+, -, ×, ÷ or fraction bar); can include average, exponents, two or more operations.	

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Generalising arithmetic		**6B:** Given a basic arithmetic calculation, write a generalised form using algebra. Word problems involving these.	
The value of an expression	**1B:** Given an algebraic expression with 1 or more variables and the values of each variable, find the value of the expression (***now with powers, roots, fractions***).	**6F:** Given an algebraic expression with 1 or more variables and the values of each variable, find the value of the expression (includes powers, roots, fractions).	
Substituting into formulae, practical problems using formulae	**13A:** Given a formula and all but one of the values, calculate the unknown value.	**6F, 11I:** Given a formula and all but one of the values, calculate the unknown value. Word problems involving these.	**13A:** Given a formula and all but one of the values, calculate the unknown value. Word problems involving these.
Rearranging formulae	**13B:** Given a formula, make a specified variable the subject (includes formulae with brackets on both sides).	**11J:** Given a formula, make a specified variable the subject (includes formulae with brackets on both sides).	**13B:** Given a formula, make a specified variable the subject (includes formulae with brackets on both sides). ***Includes substituting values into formulae after they have been rearranged.*** **13E:** More difficult rearrangements.
Constructing formulae	**13C:** Given a fixed amount and an amount per …, construct a formula, then use it to work out values (e.g., tradesmen on the job). Given a shape with dimensions marked on it, find the formula for calculating the area of the shape.	**6D:** Given a fixed amount and an amount per …, construct a formula, then use it to work out values (e.g., tradesmen on the job). Given a shape with dimensions marked on it, find the formula for calculating the area of the shape.	**13C:** Given a fixed amount and an amount per …, construct a formula, then use it to work out values (e.g., tradesmen on the job). Given a shape or ***solid*** with dimensions marked on it, find the formula for calculating the area/***volume*** of the shape.
Formulae by induction/ Number patterns and rules	**13D:** Given the first few members of a pattern, look at how the pattern is formed and hence find a formula for the nth case.	**6E:** Given the first few members of a pattern, look at how the pattern is formed and hence find a formula for the nth case. Use this formula to find the value at n = …	**13D:** Given the first few members of a pattern, look at how the pattern is formed and hence find a formula for the nth case. Use this formula to find the value at n = …
Linear graphs			
Number sequences		**5F:** Given the start of a number sequence (integers, fractions), state the next … terms and give the rule used (***in words or as a formula***) to find the next member (arithmetic and geometric sequences only). Given the first number and a rule, generate the next … terms in the sequence. ***Given the formula for the general term, find the first ... terms of the sequence. Word problems involving these parameters.***	**14I:** Given the start of a number sequence (integers, fractions), state the next … terms. Show that a number sequence is arithmetic or geometric. Find the formula for the general term (arithmetic or geometric sequences; can be given the start of the sequence or any two non-consecutive terms). Using this to find the n^{th} term in the sequence. Determining whether a particular number is a member of the sequence. Given three consecutive arithmetic terms in k, find the value of k. Finding the first term of the sequence that exceeds ...
Recurrence relationships			**14J:** Given the starting term and the recurrence relationship, find the next … terms in the sequence. Given the starting term and the recurrence relationship, find the explicit formula for u_n.
Area, volume and capacity			
Area		**1C:** Selecting sensible units to measure the area of various objects.	
Conversion of area units	**7C:** Converting between $km^2 \leftrightarrow ha \leftrightarrow m^2 \leftrightarrow cm^2 \leftrightarrow mm^2$. ***Estimating the area of objects (and then checking them).***	**1C:** Converting between $km^2 \leftrightarrow ha \leftrightarrow m^2 \leftrightarrow cm^2 \leftrightarrow mm^2$. Word problems involving these.	

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
The area of a rectangle		**7B:** Given a rectangle with its side lengths, find the area. **7B, 7D:** Word problems involving these parameters.	
The area of a triangle	**7C:** ***Using Heron's Formula to find the area of a triangle (given the side lengths).***	**7B:** Given the base and height of a triangle, find its area. **7B, 7D:** Word problems using these parameters.	
The area of parallelograms		**7B:** Given the base and height of a parallelogram find its area. **7B, 7D:** Word problems using these parameters.	
The area of trapezia		**7B:** Given the lengths of the parallel sides and the distance between them, find the area. **7B, 7D:** Word problems using these parameters.	
The area of compound shapes	**7E:** Given a compound shape (using rectangles, triangles, parallelograms, trapezia) and the required side lengths, find the area (including giving the area in terms of x). Word problems involving these parameters.		
Volume	**7E:** Converting between $m^3 \leftrightarrow cm^3 \leftrightarrow mm^3$. Finding the volume (given appropriate dimensions) of prisms, cones, pyramids, ***spheres***. ***Finding a formula for the volume of a given solid (dimensions are letters).*** Word problems using the above parameters.	**1D:** Converting between $m^3 \leftrightarrow cm^3 \leftrightarrow mm^3$. ***Word problems involving this.*** **15A:** Finding the volume (given appropriate dimensions) of prisms, cones, pyramids, and spheres. Word problems using the above parameters.	
Capacity	**7E:** Converting between mL ↔ L ↔ kL. Converting between units of volume and units of capacity. Given a solid of uniform cross-section and its dimensions (or the end area and length), find the solid's capacity. Word problems using the above parameters.	**7E:** Converting between mL ↔ L ↔ kL. Converting between units of volume and units of capacity. Word problems using the above parameters. **15B:** Given a solid of uniform cross-section and its dimensions (or the end area and length), find the solid's capacity. **15B, 15C:** Word problems using the above parameters.	
Linear equations/inequations			
What are equations?		**11G:** Given a statement or a scenario in words, write it as an equation involving *x*.	
Solving simple equations		**11A:** Solving by inspection (one-step equations only, answer is always an integer, numbers involved are generally 100 or less). Solving by trial and error where possible answers are given (two-step equations, integer coefficients/constants less than 50). Given an equation state whether it is true for one value of x, all values or no values.	
Maintaining balance		**11B:** Find the equation which results from applying an operation (+, ×, ÷, −) to both sides (maximum of two 'steps' in the starting equation, all numbers involved are 50 or less).	

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Inverse operations			
Using flowcharts			
Solving equations	**1C:** Solving equations by isolating the unknown (2 and 3-step equations, may involve negative numbers and fractions).	**11C:** Solving equations by isolating the unknown (2 and 3-step equations, may involve negative numbers and fractions).	
Equations with a repeated unknown	**1C:** Equations that require expanding/simplifying (can have brackets on one or both sides). Equations with *x* on both sides.	**11D:** Equations that require expanding/simplifying (can have brackets on one or both sides, can have two brackets on one side). Equations with *x* on both sides.	
Fractional equations	**1D:** Integers in the denominator (no greater than 10). One or two fractions on the LHS, one only on the RHS. Numerators are expressions in *x*.	**11E:** Integers in the denominator (no greater than 10). Numerators are expressions in *x*.	
Unknown in the denominator	**1D:** One or all denominators are expressions in *x*. Numerators can be integers, or expressions in x also (must always simplify to a linear equation - no quadratics).	**11F:** One or all denominators are expressions in *x*. Numerators can be integers, or expressions in x also (must always simplify to a linear equation - no quadratics).	
Problem solving with equations	**1F:** Word problems based on (or combining) any of the problem types specified above. **1G:** Money problems based on (or combining) any of the problem types specified above. **1H:** Motion problems based on (or combining) any of the problem types specified above. **1I:** Mixture problems based on (or combining) any of the problem types specified above.	**11H:** Word problems based on (or combining) any of the problem types specified above.	
Linear inequations	**1E:** Given an inequation, draw it on a number line.		
Solving linear inequations	**1E:** One-step inequations. Two-step inequations. Inequations involving fractions. Inequations involving brackets. Inequations with the unknown on the RHS. Inequations with the unknown on both sides (***including expanding brackets***).		**1E:** One-step inequations. Two-step inequations. Inequations involving fractions. Inequations involving brackets. Inequations with the unknown on the RHS. Inequations with the unknown on both sides (including expanding brackets). ***Inequations involving quadratics.***
Sign diagrams			**19A:** Given a graph, draw the sign diagram. Given a function, draw the sign diagram (can be quadratic or rational, may need factorising to find critical values).
The arithmetic mean-geometric mean inequality			**19D:** Using the AM-GM inequality to verify or prove mathematical facts. Using the AM-GM inequality to solve word problems.
Coordinates and lines			
The number plane		**17A:** Plotting points on a set of axes (integer coordinates, can be positive or negative). Given a set of axes with points plotted on it, state the coordinates of the points. Identify which quadrant a point lies in.	
Points on a straight line			
Graphing straight lines		**17F:** Given an equation complete a table of values and draw the graph.	

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
The equation of a line			
Gradient or slope	**6C:** Given a line on grid paper, give its gradient. Be able to draw a line on grid paper with a specified gradient. Using the gradient formula to work out the gradient of the line connecting two points. **6C, 6E:** ***Word/ geometry problems involving these.***	**17D:** Given a line on grid paper, give its gradient. Be able to draw a line on grid paper with a specified gradient. Using the gradient formula to work out the gradient of the line connecting two points.	**5C:** Given a line on grid paper, give its gradient. Be able to draw a line on grid paper with a specified gradient. Using the gradient formula to work out the gradient of the line connecting two points. ***Using gradient to determine whether or not a set of points is collinear.***
Parallel and perpendicular lines	**6C:** Given the gradient of a line, give the gradient of all lines parallel/ perpendicular to it.	**17K:** Given the gradient of a line, give the gradient of all lines parallel/ perpendicular to it. Given the gradients of two lines, identify if they are perpendicular, parallel or neither. Given the coordinates of the ends of a line segment (one or two of which have been blanked out), and the gradient of a line parallel/perpendicular to it, find the unknown coordinate(s)	**5C:** Given the gradient of a line, give the gradient of all lines parallel/perpendicular to it. Given the gradients of two lines, identify if they are perpendicular, parallel or neither. Given the coordinates of the ends of a line segment (one or two of which have been blanked out), and the gradient of a line parallel/perpendicular to it, find the unknown coordinate(s). **5E:** ***Finding the perpendicular bisector of a line segment.***
Using gradients	**6D:** Given a graph, interpret the gradient of various sections.	**17L:** Given a graph, calculate and interpret the gradient of various sections.	
Graphing lines from equations	**6G:** Given an equation, find the gradient and y-intercept, and hence sketch the graph.	**17G:** Given an equation, find the gradient. **17H:** Graphing the line, given the gradient and y-intercept.	**5E:** Given an equation, find the gradient.
The **general form** of a straight line, $Ax + By = C$	**6H:** Find the gradient of a line in general form. ***Given a point and the gradient (or two points), find the equation of the line in general form.***	**17H:** Drawing the graph of a line in general form (using axes intercepts).	**5E:** Finding the equation of a line in general form (using axes intercepts).
Special lines	**6F:** Identifying and drawing horizontal/vertical lines from the equation. ***Finding the equation of a line through two points (where the line is horizontal/ vertical)***.	**17J:** Identifying and drawing horizontal/vertical lines from the equation. Finding the equation of a line through two points (where the line is horizontal/ vertical).	
The *x*- and *y*-intercepts	**6H:** Given an equation, find the axes intercepts and draw the graph using them.	**17H:** Given an equation, find the axes intercepts and draw the graph using them.	
Finding equations from graphs	**6G:** Given a graph, find the gradient and *y*-intercept, and hence the equation of the line. Given a graph, find the rule connecting the variables.	**17G:** Given a graph, find the gradient and *y*-intercept, and hence the equation of the line. Given a graph, find the rule connecting the variables.	**5E:** Given a graph, find the equation of the line. Given a graph, find the rule connecting the variables.
Finding the equation of a line	**6G:** Given a point and a gradient, find the equation of the line. Given the axes intercepts, find the equation of the line. Given two points, find the equation of the line.	**17G:** Given a point and a gradient, find the equation of the line. Given two points, find the equation of the line.	**5E:** Given a point and a gradient, find the equation of the line. Given two points (can include axes intercepts), find the equation of the line.
Does a point lie on the line?	**6I:** Given an equation and a coordinate pair, work out whether the point lies on the line. ***Given an equation and a point with an unknown coordinate (that lies on the line), find the unknown coordinate.***	**17I:** Given an equation and a coordinate pair, work out whether the point lies on the line. Given an equation and a point with an unknown coordinate (that lies on the line), find the unknown coordinate.	
The distance between two points	**6A:** Using Pythagoras' theorem to work out the distance between two points (points may be already plotted on a set of axes, or you may have to plot them first). Using the distance formula to calculate the distance between two points.	**17B:** Using Pythagoras' theorem. Using the distance formula.	**5A:** Using Pythagoras' theorem. Using the distance formula.
Midpoints	**6B:** Finding the midpoint of a line segment from a graph. Using the midpoint formula to find the midpoint of a line segment, given the points at each end. Given a point, and the midpoint, find the coordinates of the other end of the line segment. **6E:** Geometry problems involving this.	**17C:** Finding the midpoint of a line segment from a graph. Using the midpoint formula to find the midpoint of a line segment. Given a point, and the midpoint, find the coordinates of the other end of the line segment.	**5B:** Finding the midpoint of a line segment from a graph. Using the midpoint formula to find the midpoint of a line segment. Given a point, and the midpoint, find the coordinates of the other end of the line segment.
Using coordinate geometry	**6A:** Using this to work out whether a triangle defined by three given points is scalene, isosceles, equilateral or right-angled. **6E:** Geometry problems involving this.		**5D:** Using the distance formula, gradient formula and midpoint formula to check the truth of a geometrical fact, or to prove a geometrical fact. **5G:** Three dimensional coordinate geometry problems.
Distance from a point to a line			**5F:** Given the equation of a line, and the coordinates of a point (not on the line), find the shortest distance between them. Finding the distance between two parallel lines.

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Transformations			
Reflections and line symmetry	**15C:** Given half an image, draw the other half as a mirror reflection. Given some geometrical shape drawn on grid paper and a mirror line (all on grid paper), draw the image. ***Given a point, find the coordinates of its image if it is reflected about the x-axis, y-axis, or the line y = x. Word problems using these parameters.*** Given a figure, draw in any lines of symmetry (or say that it has none).	**25A:** Given some geometrical shape drawn on grid paper and a mirror line (all on grid paper), draw the image (object can cross the mirror line). Identify a transformation as a reflection. Given half an image, draw the other half as a mirror reflection. Given a point, find the coordinates of its image if it is reflected about the x-axis, y-axis, or the line $y = x$. Word problems using these parameters. Given a figure, draw in any lines of symmetry (or say that it has none).	**7B:** Given a point ***or function***, find its image if it is reflected about the x-axis, y-axis, $y = x$ or $y = -x$. Combining a reflection with a translation to find the image of a point.
Rotations and rotational symmetry	**15B:** Given a starting figure (may or may not be on grid paper), a centre of rotation and an angle of rotation, draw the rotated object. ***Given a point and a rotation about the origin O, give coordinates of the point's image. Word problems using these parameters.***	**25B:** Given a starting figure (may or may not be on grid paper), a centre of rotation and an angle of rotation, draw the rotated object. Given a point and a rotation about the origin O, give coordinates of the point's image. Given a diagram, find the order of rotational symmetry.	**7C:** Given a point ***or function*** and a rotation about the origin O, give the image. ***Combining a rotation with a translation or reflection to obtain the image of a point/function.***
Translations	**15A:** Given a starting figure on grid paper, and the required translation (***as a vector or directed line segment***), draw the translated figure. Given the starting figure and the translated figure, give the translation ***as a translation vector***. Calculating the distance moved under a given translation.	**25C:** Given the starting figure/point and the translated figure/point, give the translation as a translation vector. Given a starting figure on grid paper and the required translation, draw the translated figure. Calculating the distance moved under a given translation.	**7A:** Given a starting ***point or function*** and the required translation, give the translated ***point or function***.
Enlargements and reductions	**15D:** Given a starting object and the enlarged/reduced image, find the scale factor. ***Given a starting object and the enlarged/reduced image, locate the centre of enlargement. Given a starting figure, centre of enlargement and a scale factor, draw the enlarged/reduced image. Word problems using these parameters.***	**15D:** Given a starting figure, centre of enlargement and a scale factor, draw the enlarged/reduced shape. Given a starting object and the enlarged/reduced image, find the scale factor.	**7D:** Given a point or function, a dilation factor and a centre of enlargement (usually O), draw the image of the point or function. Vertical and horizontal dilations.
Tessellations	**15E:** Given a shape, draw the tessellation (can be drawn on a grid; doesn't have to be). ***Includes starting with a basic shape and altering the sides in some way.***		
Similar figures		**14C:** Given two similar figures, find the unknown side length.	
Similar triangles	**24D:** Given a figure with triangles, establish that the triangles are similar. Using similarity to determine unknown side lengths. **24E:** Problem solving based on this.	**14D:** Given a figure with triangles, establish that the triangles are similar. Using similarity to determine unknown side lengths. **14E:** Problem solving based on this.	**6D:** Given a figure with triangles, establish that the triangles are similar. Using similarity to determine unknown side lengths. Problem solving based on this.
Areas and volumes of similar objects			**6E:** Given two similar shapes (and their areas/ dimensions), find the unknown length/area/volume. Word problems based on these.
Congruent figures		**14A:** Given a pair of figures, state whether or not they are congruent. Given two congruent figures (with labels) identify corresponding side/angles in each.	**6A:** Given a pair of figures, state whether or not they are congruent. Given two congruent figures (with labels) identify corresponding side/angles in each.
Congruence of triangles	**24C:** Given two triangles, state whether or not they are congruent (and give reasons - use one of the tests). Deductive geometry problems based on this.	**14B:** Given two triangles, state whether or not they are congruent (and give reasons - use one of the tests). Deductive geometry problems based on this.	**6C:** Given two triangles, state whether or not they are congruent (and give reasons - use one of the tests). Deductive geometry problems based on this.
The midpoint theorem	**24F:** Using the midpoint theorem to determine unknown lengths (in triangles or in larger geometric figures where triangles are involved).		
Sets			

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Sets and their members	**5A:** Listing all the members of a given set. Stating whether an element is a member of a specified set. Stating whether one set is a subset of another.	**3A:** Listing all the members of a given set. Stating whether an element is a member of a specified set. Stating whether one set is a subset of another. **3E:** Stating how many members are in a given set.	**1A:** Listing all the members of a given set. Stating whether an element is a member of a specified set. Stating whether one set is a subset of another. Stating how many members are in a given set.
Complement of a set	**5D:** Given a universal set *U* and a subset, find the complement of the subset (elements may be listed for you, or you may have to list them yourself).	**3B:** Given a universal set *U* and a subset, find the complement of the subset (elements may be listed for you, or you may have to list them yourself).	**1C:** Given a universal set *U* and a subset, find the complement of the subset (elements may be listed for you, or you may have to list them yourself).
The intersection of sets	**5A:** Given two sets (elements already listed), work out their intersection.	**3E:** Given two sets (elements already listed), work out their intersection.	**1D:** Given two sets (elements already listed), work out their intersection ***(you may have to use a Venn diagram)***.
The union of sets	**5A:** Given two sets (elements already listed), work out their union.	**3E:** Given two sets (elements already listed), work out their union.	**1D:** Given two sets (elements already listed), work out their union (***you may have to use a Venn diagram***).
Disjoint sets	**5A:** Given two sets, state whether or not they are disjoint.		**1D:** ***Using the fact that two sets are/are not disjoint to explain how they interact.***
Special number sets	**5B:** Explaining why a number is/is not rational. Working with the elements of N, Z, Z^+, Z^-, Q, Q', R.	**3B:** Explaining why a number is/is not rational. Working with the elements of N, Z, Z^+, Z^-, Q, Q', R.	**1A:** Explaining why a number is/is not rational. Working with the elements of N, Z, Z^+, Z^-, Q, Q', R.
Set builder notation, interval notation, square bracket notation	**5C:** Given a set in set builder notation, state whether it is finite or infinite. Given a set in set builder notation, write down what it means in words. Given a set in set builder notation, list its elements (if possible) and state how many elements it contains. Given a set in set builder notation, illustrate the set on a number line. Writing a particular set using set builder notation.	**3C:** Given a set in interval notation, write down what it means in words. Given a number line, write what it shows in interval notation (and vice versa).	**1B:** Given a set in interval notation, write down what it means in words. **1B, 19B:** Given a number line, write what it shows in interval ***or square bracket*** notation (and vice versa). **19B:** Using interval notation ***or square bracket notation*** to describe inequalities.
Venn diagrams	**5E:** Given a universal set U, and sets A (and B) which are subsets of U, illustrate the sets on a Venn diagram (might need to list the elements first; might also need to find their union and intersection). **5E, 10H:** Drawing a Venn diagram and shading the region(s) corresponding to a given statement. ***Given a Venn diagram and the number of elements in each region, work out how many elements are in a particular subset of U (e.g., the number of elements in X').*** Word problems using the above	**3D:** Given a universal set U, and sets A (and B) which are subsets of U, illustrate the sets on a Venn diagram (might need to list the elements first; might also need to find their union and intersection). Drawing a Venn diagram and shading the region(s) corresponding to a given statement. **3F:** Word problems using the above parameters.	**1C:** Given a universal set U, and sets A (and B) which are subsets of U, illustrate the sets on a Venn diagram (might need to list the elements first; might also need to find their union and intersection). ***Placing elements of a set on a Venn diagram.*** **1D:** Drawing a Venn diagram and shading the region(s) corresponding to a given statement. Given a partly shaded Venn diagram, describe the shaded region in words. **1E:** Word problems using the above parameters.
The algebra of sets			**1F:** Using Venn diagrams to show the validity of the laws for the algebra of sets. Using the laws to show that various statements involving sets are true.
Finding probabilities from Venn diagrams		**19F:** Given the appropriate information, place it on a Venn diagram. Using a Venn diagram to calculate probabilities.	**11C:** Given the appropriate information, place it on a Venn diagram. **11D, 11I:** Using a Venn diagram to calculate probabilities (Ex 11I deals with conditional probabilities).
Solids and polyhedra			
Types of solids			
Freehand drawings of solids			
Isometric projections			

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Constructing block solids			
Nets of solids		**21G:** Assembling solids from a net. (Note: this uses only prisms, pyramids, cones and cylinders.) Drawing the net for a solid (rectangular prisms, pyramids only). ***Using the net to find the surface area of the solid.***	
Surface area	**7D:** Cubes, prisms, ***pyramids, cones,*** cylinders, spheres, compound solids.	**7C:** Cubes, prisms, ***pyramids, cones,*** cylinders, spheres, compound solids. **7C, 7D:** Word problems involving these.	
Algebraic expansion and factorisation			
The Distributive Law	**3C:** One term (can be letters, number or a combination; can have exponents) outside the brackets, up to three terms inside the brackets.	**9C:** One term (can be letters, number or a combination; can have exponents) outside the brackets, up to three terms inside the brackets.	**2A:** One term (can be letters, number or a combination; can have exponents) outside the brackets, up to three terms inside the brackets.
Simplifying algebraic expressions	**3C:** Expanding and then simplifying by collecting like terms (can have two brackets to expand or just one).	**9C:** Expanding and then simplifying by collecting like terms (can have two brackets to expand or just one).	**2A:** Expanding and then simplifying by collecting like terms (can have two brackets to expand or just one).
Brackets with negative coefficients	**3C:** One negative term (can be letters, number or a combination; can have exponents) outside the brackets, two inside the brackets. Expanding expressions involving these, then collecting like terms.	**9C:** One negative term (can be letters, number or a combination; can have exponents) outside the brackets, ***up to three*** inside the brackets. Expanding expressions involving these, then collecting like terms.	**2A:** One negative term (can be letters, number or a combination; can have exponents) outside the brackets, up to three inside the brackets. Expanding expressions involving these, then collecting like terms.
The product $(a + b)(c + d)$	**3D:** Using the 'FOIL' rule: $(a + b)(c + d) = ac + ad + bc + bd$. One set of brackets, all squared.	**9D:** Expanding these expressions by repeated use of the Distributive Law. **9E:** Using the 'FOIL' rule: $(a + b)(c + d) = ac + ad + bc + bd$. Includes cases with one set of brackets, all squared.	**2A:** Using the 'FOIL' rule: $(a + b)(c + d) = ac + ad + bc + bd$.
Perfect Squares expansion	**3F:** Using the Perfect Squares expansion rule. Expanding expressions involving these, then collecting like terms.	**9E:** Using the Perfect Squares expansion rule. Expanding expressions involving these, then collecting like terms.	**2A:** Using the Perfect Squares expansion rule.
Difference of Two Squares expansion	**3E:** Using the Difference of Two Squares expansion rule. **3F:** Expanding expressions involving these, then collecting like terms.	**9E:** Using the Difference of Two Squares expansion rule.	**2A:** Using the Difference of Two Squares expansion rule.
Further expansion	**3G:** Two terms in one bracket, three terms in the other. ***Expanding perfect cube expressions.*** Expressions that have a number ***or letter*** out the front, e.g., $3(x + 4)(x + 5)$. ***Three brackets multiplied together.***	**9D:** Two terms in one bracket, three terms in the other.	**2C:** Two terms in one bracket, three terms in the other. Expressions that have a number or letter out the front, e.g., $3(x + 4)(x + 5)$. Three brackets multiplied together.
Binomial expansion	**3H:** Using the binomial expansion to expand and simplify a perfect cube, or an expression in brackets to the 4^{th} power.		**2D:** Using the binomial expansion to expand and simplify a perfect cube, ***or to higher powers***.
Geometric applications		**9F:** Writing expressions for the perimeters of polygons (don't have to be regular). Writing expressions for the areas of polygons (rectangles, triangles, and compound shapes involving these).	
Factorisation of algebraic expressions	**8A:** Factorising by taking out a common factor (two or three terms; the 'common factor' may be an expression in brackets; ***may need to factorise part of the expression first***).	**13A:** Finding the HCF of two terms. Given a partial factorisation, write the missing factor. **13B:** Factorising by taking out a common factor (two or three terms; the 'common factor' may be an expression in brackets).	**2B:** Factorising by taking out a common factor (two or three terms; the 'common factor' may be an expression in brackets).
Difference of Two Squares (DOTS) factorising	**8B:** Using the DOTS rule to factorise expressions. Factorising using a common factor and then using DOTS. Using DOTS where one ***or both*** of the squares is an expression in brackets.	**13F:** Using the DOTS rule to factorise expressions.	**2B:** Using the DOTS rule to factorise expressions. Factorising using a common factor and then using DOTS.
Perfect Squares factorisation	**8C:** Given a perfect square (coefficient of x^2 is 1), factorise it. Given an algebraic expression, factorise using common factors and then using perfect squares. Given a perfect square (coefficient of x^2 is not 1), factorise it.		**2B:** Given a perfect square (coefficient of x^2 is 1), factorise it. Given an algebraic expression, factorise using common factors and then using perfect squares. Given a perfect square (coefficient of x^2 is not 1), factorise it.

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Factorising quadratic trinomials	**8D:** ***Factorising expressions with four terms (interim step to factorising quadratic trinomials)*** **8E:** Given a suitable quadratic trinomial, factorise it using this method. Given an algebraic expression, factorise using common factors and then using this method.	**13C:** Factorising expressions with four terms (interim step to factorising quadratic trinomials) **13D:** Given a suitable quadratic trinomial, factorise it using this method. Given an algebraic expression, factorise using common factors and then using this method.	**2E:** Factorising expressions with four terms (interim step to factorising quadratic trinomials) **2F:** Given a suitable quadratic trinomial, factorise it using this method. Given an algebraic expression, factorise using common factors and then using this method.
Factorisation of $ax^2 + bx + c$, $a \neq 1$	**8F:** Factorising by 'splitting' the x-term. Factorising expressions where the coefficient of x^2 is negative.	**13E:** Factorising by 'splitting' the x-term. Factorising expressions where the coefficient of x^2 is negative.	**2G:** Factorising by 'splitting' the x-term. Factorising expressions where the coefficient of x^2 is negative. ***Factorising using common factors and then by 'splitting' the x-term.***
Ratio			
Ratio		**12A:** Expressing two quantities as a ratio (units are the same). Expressing two quantities as a ratio (units are different and need to be converted). Word problems using these parameters.	
Writing ratios as fractions			
Equal ratios		**12B:** Writing ratios in simplest form (integers). Writing ratios in simplest form (fractions/mixed numbers with denominator 2, 3, 4, or 5). Writing ratios in simplest form (decimals, up to 2 d.p.).	
Proportions		**12C:** Given two equal ratios (where one of the numbers is blanked out), find the missing number. Given a ratio and one quantity, find the size of the other quantity (word problems).	
The unitary method for ratios		**12D:** Given a ratio a : b, find what **one** part is, and hence find the whole quantity.	
Using ratios to divide quantities		**12E:** ***Given a ratio, find the total number of parts it represents.*** Given an amount and a ratio, divide the amount in that ratio (e.g., divide \$50 in the ratio 1:4). Given the ratio of a mixture and how much of the mixture in total is required, find how much of a component is needed. Word problems involving these parameters.	
Gradient or slope			
Line Graphs			
Properties of line graphs		**17F:** Given a graph, state the independent and dependent variables.	
Estimating from line graphs		**20A:** Given a line graph, be able to describe what is happening with a story. Given a 'story', draw the corresponding graph. **20B:** Given a graph, estimate (for example) the initial value, the value at a particular time, when the maximum or minimum occurred…	
Conversion graphs		**20C:** Currency exchange (both directions). Also temperature conversions.	

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Travel graphs		**12I:** Given a graph, estimate (for example) the time taken for the trip, when certain events occurred, the distance of the trip, the distance travelled after a certain period of time…	
Continuous and discrete graphs		**17A:** Graphing the points, stating whether the points are collinear; giving a rule connecting the variables. **17E:** Stating whether or not the relationship between variables is linear. Stating whether it is sensible to join points with a straight line. Using the graph to predict values.	
Using technology to draw graphs			
Time series data		**20D:** Given a table of values, draw a line graph. Given a line graph, identify any trends in the data. Given a line graph, use it to predict values.	
Step graphs		**20E:** Using a step graph to find values. Given a step graph, express the information it contains in table or word form.	
Circles			
Parts of a circle			
Circumference	**7B:** Finding the perimeter of shapes involving parts of circles ***(including arcs and sectors)***. Finding a formula for the perimeter of a shape involving circles or parts of circles.	**7B:** Finding the perimeter of shapes involving parts of circles (including arcs and sectors). Word problems involving this.	
Area of a circle (or ellipse)	**7C:** Finding the area of compound shapes involving circles (including giving the area in terms of x). Word problems involving these parameters.	**7B:** Given the radius/diameter, calculate the area of a circle (or a part of a circle). Calculate the area of an ellipse (or part ellipse). Finding the area of compound shapes involving circles. Word problems involving these.	
Cylinders			
Spheres			
Chance/Probability			
Describing chance			
Assigning numbers to chance			
Experimental probability	**10A:** Using the results of a survey/experiment to estimate the probability of events. **10B:** Given a data set, calculate the frequency/relative frequency of each outcome, and estimate the probability of each outcome happening.	**19A:** Using the results of a survey/experiment to estimate the probability of events. **19D:** Given a data set, calculate the frequency/relative frequency of each outcome, and estimate the probability of each outcome happening.	**11A:** Using the results of a survey/experiment to estimate the probability of events. **11B:** Given a data set, calculate the frequency/relative frequency of each outcome, and estimate the probability of each outcome happening.
Probabilities from two-way tables			
Listing possible outcomes (sample spaces)	**10D:** Sample space: Listing all the possible outcomes of an experiment.	**19E:** Sample space: Listing all the possible outcomes of an experiment.	**11C:** Sample space: Listing all the possible outcomes of an experiment.

	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Theoretical probability	**10E:** Using the (number of outcomes in that event) ÷ (total number of outcomes) formula for single events. For compound events (where each outcome is equally likely), listing all the possible outcomes and then using the formula. Calculating the probability of complementary events.	**19B:** Using the (number of outcomes in that event) ÷ (total number of outcomes) formula for single events. For compound events (where each outcome is equally likely), listing all the possible outcomes and then using the formula. Calculating the probability of complementary events.	
Using grids to find probabilities	**10D, 10F:** Using a two-dimensional grid to list the sample space, and use it to calculate probabilities.	**19E:** Using a two-dimensional grid to list the sample space. **19F:** Using a 2-D grid to calculate probabilities.	**11C:** Using a two-dimensional grid to list the sample space. **11D:** Using a 2-D grid to calculate probabilities.
Multiplying probabilities (independent events)	**10G:** Given the individual probabilities of two independent events, multiplying their probabilities to find the probability of **both** occurring.	**19G, 19K:** Given the individual probabilities of two independent events, multiplying their probabilities to find the probability of **both** occurring.	**11E:** Given the individual probabilities of two independent events, multiplying their probabilities to find the probability of **both** occurring (includes sampling **with** and **without replacement**).
Tree diagrams	**20A:** Using a tree diagram to illustrate/list the possible outcomes of compound events (up to three 'stages' in the tree). **20B:** Using this to calculate the probability of particular events (each 'branch' is labelled with the probability; ***using dependent events as well as independent ones***). ***Working with large sample spaces, using the same principles as tree diagrams (just not drawing them).***	**19E:** Using a tree diagram to illustrate/list the possible outcomes of compound events (up to three 'stages' in the tree). **19F:** Using this to calculate the probability of particular events. **19H:** Using tree diagrams to calculate probabilities of compound events (each branch is labelled with the probability. **19I:** Considering sampling with and without replacement (but still using a tree diagram to calculate probabilities).	**11C:** Using a tree diagram to illustrate/list the possible outcomes of compound events (up to three 'stages' in the tree). **11D:** Using this to calculate the probability of particular events. **11F:** Using tree diagrams to calculate probabilities of compound events (each branch is labelled with the probability. **11G:** Considering sampling with and without replacement (but still using a tree diagram to calculate probabilities).
Binomial probabilities	**20C:** Given a scenario, say whether or not it is a binomial experiment. Using a tree diagram to calculate probabilities of a binomial experiment, and showing how the corresponding binomial expansion gives the same numbers.		
Making probability generators			
Expectation	**10I:** Given the probability of a particular event occurring, and the number of times an experiment is conducted, find the number of times that event is expected to occur.	**19C:** Given the probability of a particular event occurring, and the number of times an experiment is conducted, find the number of times that event is expected to occur.	
Odds			
Life tables	**10C:** Using a life table to calculate the expected age at death of a person of a particular age and gender. Working out the probability that a person of a particular age/gender will die in the next … years. Finding the percentage of M/F people aged … that are expected to reach ... years of age.		
Mutually exclusive and non-mutually exclusive events		**19J:** Given a series of events, state which ones are mutually exclusive.	**19J:** Given a series of events, state which ones are mutually exclusive. Using this to find probabilities.
Rates			
Rates		**12G:** Given a rate, write down what it means. Given two quantities, work out the rate.	
Comparing prices			
Using rates		**12G:** Given a rate and one of the quantities in that rate, use it to calculate the other quantity (mainly concentrating on speed = distance/time.) **12H:** Given a graph (or having constructed a graph yourself), calculate the rate and use it to calculate other values.	
Density			

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Converting rates		**12G:** Given a rate, convert the rate so it uses different units (e.g., converting a rate in km/h to m/s).	
Algebraic Fractions			
Simplifying algebraic fractions	**21B:** Given a fraction with algebraic products in the numerator and denominator, simplify the fraction. ***(can include expressions in brackets)***		**12A:** Given a fraction with algebraic products in the numerator and denominator, simplify the fraction (can include expressions in brackets).
Multiplying algebraic fractions	**21C:** Up to 3 fractions (including squared and cubed fractions), each fraction has a letter/number/algebraic product in the numerator and denominator.		**12B:** Up to 3 fractions (including squared and cubed fractions), each fraction has a letter/number/algebraic product in the numerator and denominator.
Dividing algebraic fractions	**21C:** Two fractions (or a fraction and **a letter**), each fraction has a letter/number/algebraic product in the numerator and denominator.		**12B:** Two fractions (or a fraction and **a letter**), each fraction has a letter/number/algebraic product in the numerator and denominator.
Adding and subtracting algebraic fractions	**21D:** Adding/subtracting where each fraction has a letter/number/algebraic product in the numerator and denominator. **21E:** Adding/subtracting where one or both fractions has an algebraic expression (e.g., $x + 2$) in the numerator.		**12C:** Adding/subtracting where each fraction has a letter/number/algebraic product in the numerator and denominator. **12D:** Adding/subtracting where one or both fractions has an algebraic expression (e.g., $x + 2$) in the numerator.
Factorising then simplifying algebraic fractions	**21B:** Given an algebraic fraction, factorise numerator and/or denominator using common factors, then cancel. Algebraic fractions where the numerator and/or denominator is a quadratic.		**12A:** Given an algebraic fraction, factorise numerator and/or denominator using common factors, then cancel. Algebraic fractions where the numerator and/or denominator is a quadratic.
Evaluating algebraic fractions	**21A:** Given an algebraic fraction and the value of each unknown, evaluate the fraction.		
Surds and Pythagoras			
Radicals on a number line	**4A:** Using a geometric construction to locate a radical/surd on a number line.		
Rules for square roots	**4B:** Using the rule $\left(\sqrt{a}\right)^2 \leftrightarrow a$. Using the rule $\sqrt{a} \times \sqrt{b} \leftrightarrow \sqrt{ab}$. Using the rule $\frac{\sqrt{a}}{\sqrt{b}} \leftrightarrow \sqrt{\frac{a}{b}}$. Writing a surd in simplest form, e.g., $\sqrt{24} = 2\sqrt{6}$. ***Given a 'fraction' with a surd expression in the numerator, simplify the surd(s) and hence simplify the fraction.***		**3A:** Using the rule Using the rule $\left(\sqrt{a}\right)^2 \leftrightarrow a$. Given a 'fraction' with a surd expression in the numerator, simplify the surd(s) and hence simplify the fraction. **3B:** Using the rule $\sqrt{a} \times \sqrt{b} \leftrightarrow \sqrt{ab}$. Using the rule $\frac{\sqrt{a}}{\sqrt{b}} \leftrightarrow \sqrt{\frac{a}{b}}$. Writing a surd in simplest form, e.g., $\sqrt{24} = 2\sqrt{6}$.
Expansion of surd expressions	**4B:** Using the rule $\sqrt{a} \times \sqrt{a} = a$. Collecting 'like surds', e.g., 5√2 + 4√2 = 9√2 (up to four terms).		**3A:** Collecting 'like surds', e.g., 5√2 + 4√2 = 9√2 (up to four terms).
The Distributive Law	**4C:** Using the distributive law with surd expressions.		**3C:** Using the distributive law with surd expressions.
The product $(a + b)(c + d)$	**4C:** Using the 'FOIL' rule to expand/simplify surd expressions.		**3C:** Using the 'FOIL' rule to expand/simplify surd expressions.
Perfect Squares expansion	**4C:** Using the Perfect Squares expansion rule to expand/simplify surd expressions.		**3C:** Using the Perfect Squares expansion rule to expand/simplify surd expressions.
Difference of Two Squares expansion	**4C:** Using the Difference of Two Squares expansion rule to expand/simplify surd expressions.		**3C:** Using the Difference of Two Squares expansion rule to expand/simplify surd expressions.
Division by radicals	**4D:** Integer in the numerator, single surd in the denominator. Integer in the numerator, surd expression (in the form $a \pm b\sqrt{c}$) in the denominator.		**3D:** Integer/***surd*** in the numerator, single surd in the denominator. Integer/***surd*** in the numerator, surd expression (in the form $a + b\sqrt{c}$) in the denominator. ***Expressions involving these.***
Solving equations of the form $x^2 = k$	**16A:** Equations with the x^2 on one side and a number on the other. Equations where x^2 has something added to/subtracted from it. Equations where you need to divide both sides by an integer. ***Equations where the left hand side is not x^2, but an expression in brackets squared.***		**9A:** Equations with the x^2 on one side and a number on the other. Equations where x^2 has something added to/subtracted from it. Equations where you need to divide both sides by an integer. Equations where the left hand side is not x^2, but an expression in brackets squared.

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Equality of surds			**3E:** Given an equation in x and y involving surds, solve for x and y (given that they are both rational). May require some expanding/simplifying.
The theorem of Pythagoras		**5A:** Calculating the length of the hypotenuse (includes sides with surd lengths). Calculating the length of a shorter side (including sides with surd lengths).	**4A:** Calculating the length of the hypotenuse (includes sides with surd lengths). Calculating the length of a shorter side (including sides with surd lengths).
Problem solving using Pythagoras' Theorem		**5A, 5B:** Problem solving using these parameters. **5D:** Navigation problems using these parameters.	**4A, 4C:** Problem solving using these parameters. **4D:** Circle problems involving right angled triangles. **4E:** Three dimensional problems. **4F:** More difficult problems involving right-angled triangles.
The converse of Pythagoras' Theorem		**5C:** Testing to see whether a triangle is right angled (however, this time the three numbers don't have to be integers).	**4B:** Testing to see whether a triangle is right angled (however, this time the three numbers don't have to be integers).
Pythagorean triples			**4B:** Given a set of three numbers, state whether or not they are a Pythagorean triple. Given two numbers, calculate the third number so that a Pythagorean triple is formed.
Indices			
Algebraic products and quotients in index notation	**2A:** Simplifying algebraic products (numbers then letters in index form; ***includes negative numbers***). ***Using your calculator.***		
Index laws	**2B:** Multiplying → add indices. Dividing → subtract indices. Raising a power to another power → multiply indices. ***Writing an expression/number in simplest form with a prime number as a base.***	**2D:** Multiplying → add indices. Dividing → subtract indices. Raising a power to another power → multiply indices. **2D, 22C:** Writing an expression/number in simplest form with a prime number as a base.	**16A:** Multiplying → add indices. Dividing → subtract indices. Raising a power to another power → multiply indices. Writing an expression/number in simplest form with a prime number as a base.
Expansion laws	**2B:** Products to a power → raise each number and/or letter to that power. 'Fractions' to a power → raise numerator and denominator to that power.		**16A:** Products to a power → raise each number and/or letter to that power. 'Fractions' to a power → raise numerator and denominator to that power.
Zero and negative indices	**2B:** Anything to the power of 0 → 1 (including expressions that simplify down to the power of 0). Negative indices: $a^{-n} \leftrightarrow \frac{1}{a^n}$ (including fractions, algebraic products to a negative power). Writing numbers as a power of 2, 3, or 5 (using negative indices if necessary).	**2C:** Anything to the power of 0 → 1 (including expressions that simplify down to the power of 0). Negative indices: $a^{-n} \leftrightarrow \frac{1}{a^n}$ (including fractions, algebraic products to a negative power). Writing numbers as a power of 2, 3, or 5 (using negative indices if necessary) - also known as 'writing in simplest rational form'.	**16A:** Anything to the power of 0 → 1 (including expressions that simplify down to the power of 0). Negative indices: $a^{-n} \leftrightarrow \frac{1}{a^n}$ (including fractions, algebraic products to a negative power). Writing numbers as a power of 2, 3, or 5 (using negative indices if necessary) - also known as 'writing in simplest rational form'.
Scientific notation (standard form)	**2D:** Scientific notation ↔ ordinary decimals. Word problems involving this. Simplifying a product ***or division*** of numbers in scientific notation. ***Word problems involving this.*** Using a calculator.	**8F:** Writing numbers as powers of 10 (including negative indices where necessary). Scientific notation ↔ ordinary decimals. Word problems involving this. Simplifying a product of numbers in scientific notation. Using a calculator.	
Exponential equations	**2C:** Given an equation where *x* (or an expression in *x*) is the exponent in one or more places, make each side of the equation have the same base and equate indices to solve.	**22C:** Given an equation where *x* (or an expression in *x*) is the exponent in one or more places, make each side of the equation have the same base and equate indices to solve.	**16G:** Given an equation where *x* (or an expression in *x*) is the exponent in one or more places, make each side of the equation have the same base and equate indices to solve.
Expansion and factorisation with exponents			**16H:** Using the algebraic expansion rules to expand and simplify exponential expressions. Using the factorisation rules to factorise exponential expressions. Simplifying fractions with exponential expressions (may need to factorise first). Using these to solve exponential equations.
Rational (fractional) Indices	**2E:** Using the rule $a^{(1/n)} = \sqrt[n]{a}$ to simplify expressions. Using the calculator to evaluate these where necessary.	**2D:** Using the rule $a^{(1/n)} = \sqrt[n]{a}$ to simplify expressions. Using the calculator to evaluate these where necessary.	**16B:** Using the rule $a^{(1/n)} = \sqrt[n]{a}$ to simplify expressions. Using the calculator to evaluate these where necessary. ***May be used in conjunction with other index laws.***

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Logarithms			**16I:** Given a number, write it in the form $10^{\log a}$ (may need a calculator). Using logarithms to solve exponential equations. Word problems involving these. Using the logarithm laws to simplify logarithmic expressions. Equations ↔ logarithmic equations in base 10. Working with logarithms in other bases. Graphs of logarithmic functions.
Simultaneous Equations			
Trial and error solution			
Graphical solution	**6J:** Given an equation pair, draw their graphs on the same set of axes and hence find the point of intersection (simultaneous solution). Special cases: parallel lines, coincident lines.	**18A:** Given an equation pair, draw their graphs on the same set of axes and hence find the point of intersection (simultaneous solution). Special cases: parallel lines, coincident lines.	**14H:** Given an equation pair, draw their graphs on the same set of axes and hence find the point(s) of intersection.
Solution by substitution	**17A:** Given an equation pair where ONE of the equations has the form $x = \ldots$ or $y = \ldots$, use substitution to find the simultaneous solution.	**18B, 18C:** Given an equation pair where ONE of the equations has the form $x = \ldots$ or $y = \ldots$, use substitution to find the simultaneous solution.	
Solution by elimination	**17A:** Given an equation pair, write down the equation that results when the two are added vertically. Given an equation, write down the equation that results if it is multiplied by some constant. Given an equation pair, find the simultaneous solution using the elimination method.	**18B, 18C:** Given an equation pair, write down the equation that results when the two are added vertically. Given an equation, write down the equation that results if it is multiplied by some constant. Given an equation pair, find the simultaneous solution using the elimination method.	
Problem solving with simultaneous equations	**17B:** Problem solving using the above methods.	**18D:** Problem solving using the above methods.	
Solving non-linear simultaneous equations	**17C:** Given an equation pair (where one may be substituted into the other), find the simultaneous solution.		**14H:** Given an equation pair (where the right-hand sides can be equated), find the point(s) of intersection.
Solving simultaneous equations using technology	**17C:** Given an equation pair, find the simultaneous solution using a calculator or other technology.	**18E:** Given an equation pair, find the simultaneous solution using a calculator or other technology. Word problems involving these.	**14H:** Given an equation pair, find the point(s) of intersection using a calculator or other technology.
Quadratic Equations			
The Null Factor law	**16B:** Given a simple algebraic equation which has a product on one side and 0 on the other, use the Null Factor law to deduce that at least one of the variables must be 0. Given an equation of the same form in x (including expressions in brackets multiplied together), solve for x.	**22A:** Given a simple algebraic equation which has a product on one side and 0 on the other, use the Null Factor law to deduce that at least one of the variables must be 0. Given an equation of the same form in x (including expressions in brackets multiplied together), solve for x.	**9B:** Given an algebraic equation in x (including expressions in brackets multiplied together), solve for x.
Equations of the form $ax^2 + bx = 0$	**16C:** Given an equation of the form $ax^2 + bx = 0$, factorise the LHS and thus solve for x. Given an equation with unknowns appearing on both sides, collect like terms (making the RHS = 0), factorise the LHS and solve.	**22A:** Given an equation of the form $ax^2 + bx = 0$, factorise the LHS and thus solve for x. Given an equation with unknowns appearing on both sides, collect like terms (making the RHS = 0), factorise the LHS and solve.	**9B:** Given an equation of the form $ax^2 + bx = 0$, factorise the LHS and thus solve for x. Given an equation with unknowns appearing on both sides, collect like terms (making the RHS = 0), factorise the LHS and solve.
Solving equations using 'Difference of Two Squares' (DOTS)		**22A:** Using the DOTS rule to factorise, and then solve.	**9B:** Using the DOTS rule to factorise, and then solve.
Solving equations of the form $ax^2 + bx + c = 0$	**16C:** Factorising using the 'splitting the x-term' method, then solving for the unknown. Factorising using common factors and then using this method, before solving for the unknown. Given an equation with unknowns appearing on both sides, expand, collect like terms (making the RHS = 0), factorise the LHS and solve. ***Given an equation with algebraic fractions, manipulate it to get a quadratic equation and then solve.***	**22A:** Factorising using the 'splitting the x-term' method, then solving for the unknown. Given an equation with unknowns appearing on both sides, expand, collect like terms (making the RHS = 0), factorise the LHS and solve.	**9B:** Factorising using the 'splitting the x-term' method, then solving for the unknown. Given an equation with unknowns appearing on both sides, expand, collect like terms (making the RHS = 0), factorise the LHS and solve. ***Given an equation with algebraic fractions, manipulate to form a quadratic equation and then solve the quadratic.***

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Completing the square	**16D:** Given an algebraic expression, state what constant must be added on to make it a perfect square. Solving quadratics by completing the square (including cases where the coefficient of x^2 is **not** 1).		**9C:** Given an algebraic expression, state what constant must be added on to make it a perfect square. Solving quadratics by completing the square (including cases where the coefficient of x^2 is **not** 1).
Problem solving with quadratic equations	**16E:** Given a 'word problem', translate it into a quadratic equation and solve.	**22B:** Given a 'word problem', translate it into a quadratic equation and solve.	**9D:** Given a 'word problem', translate it into a quadratic equation and solve.
Simultaneous equations involving quadratics	**17C:** Given an equation pair (where one ***or both*** of the equations are quadratics) substitute one into the other and solve for x, then solve for y.		
Solving harder equations using technology		**22D:** Using a graphics calculator to find the solution to quadratic equations (and more difficult ones).	
The quadratic formula			**9E:** Using the quadratic formula to solve quadratic equations. Equations where you start with algebraic fractions on both sides, and you need to manipulate the equation to make a quadratic. Using the quadratic formula to show that a quadratic has no real solutions. Calculating the discriminant Δ; using it to state the nature of the solutions of a given quadratic. Finding the values of k such that the quadratic has two real roots/a repeated root/no real roots.
Trigonometry			
Trigonometry	**12B:** Given a right-angled triangle and one of the other angles, label the sides as hypotenuse (H), opposite (O) or adjacent (A). **12B, 25A:** Using a unit circle diagram to find the sine, cosine and tangent of angles between 0° and 90°.	**16A:** Given a right-angled triangle and one of the other angles, label the sides as hypotenuse (H), opposite (O) or adjacent (A).	**10D:** Using a unit circle diagram to find the sine, cosine and tangent of angles between ***0° and 360° (and some negative angles)***.
The trigonometric ratios	**12C:** Given a right-angled triangle with two sides (***letters or numbers***) and one of the angles, set up an equation using one of the trigonometric ratios (***you may need to find the third side***). Given a right angled triangle, a side and an angle, calculate the length of the unknown side using a suitable ratio. Given a right angled triangle and two sides, calculate the unknown angle using a suitable ratio.	**16B:** Given a right-angled triangle with two sides (***letters or numbers***) and one of the angles, set up an equation using one of the trigonometric ratios (you may need to find the third side). **16C, 16D, and 16E:** Given a right angled triangle, a side and an angle, calculate the length of the unknown side using a suitable ratio. Given a right angled triangle and two sides, calculate the unknown angle using a suitable ratio.	**10A:** Given a right-angled triangle with two sides (***letters or numbers***) and one of the angles, set up an equation using one of the trigonometric ratios (you may need to find the third side). Given a right angled triangle, a side and an angle, calculate the length of the unknown side using a suitable ratio. Given a right angled triangle and two sides, calculate the unknown angle using a suitable ratio.
Problem solving with trigonometry	**12D:** Problem solving based on the question types encountered in 12C. **12F:** Three-dimensional problem solving.	**16F:** Problem solving based on the question types encountered in 16C, 16D and 16E.	**10B:** Problem solving based on the question types encountered in 10A. **10C:** Three-dimensional problem solving.
Introduction to networks			
Network diagrams			**25A:** Given a network diagram, state the number of vertices/edges/arcs. Given a network diagram, name the vertices/edges/arcs. Naming the paths going between two points. Be able to state what the vertices/edges in a network diagram represent. ***Finding the valence of a vertex. Identifying types of graphs (simple/not simple, connected/ disconnected, complete/not complete). Identifying and drawing Eulerian circuits, Hamiltonian circuits, Hamiltonian paths, spanning trees.***
Constructing networks			**25B:** ***Using an adjacency matrix*** to determine if two networks are topologically equivalent.
Precedence networks			

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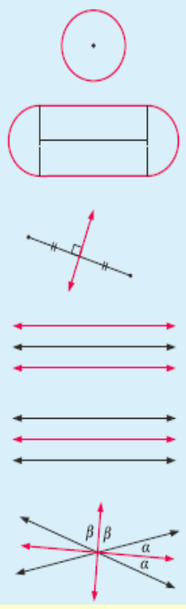
Counting pathways			**25D:** Given a network diagram, count the number of pathways from one point to another (by labelling vertices). Counting the number of pathways from one point to another, given that you **have to go through** some third point. Counting the number of pathways from one point to another, given that you **must not go through** some third point.
Shortest path			**25D:** Given a labelled network diagram, calculate the shortest path between two points, and give the path. Using Dijkstra's algorithm to find the shortest path and its length (including problems where you must pass through a point, or where a connection becomes unavailable).
Shortest connection problems (minimum spanning tree)			**25D:** Using trial and error. Using Prim's algorithm (nodes **haven't** been connected). Using the 'Nearest Neighbour' algorithm (nodes **have** been connected). Word problems where you need to find the minimum spanning tree for a network.
Chinese Postman problem			**25D:** Given a weighted network diagram, solve the Chinese Postman problem. Word problems involving this.
Travelling Salesman problem			**25D:** Given a weighted network diagram, solve the Travelling Salesman problem. Word problems involving this.
Isomorphism and adjacency matrices			**25B:** Given a series of network diagrams, identify which are isomorphic. Given a network diagram, construct an adjacency matrix. Given an adjacency matrix, construct a possible network diagram. Using an adjacency matrix to identify features of a network diagram (isolated vertices, loops). Using an adjacency matrix to determine if two networks are topologically equivalent.
Directed networks			**25C:** Given a **directed** network, find the adjacency matrix; use this to determine if there are any sources or sinks. Using dominance matrices to represent directed networks (esp. sporting competitions) and answer questions.
Locus			
Everyday applications of loci			**24A:** Given a scenario, draw the locus/shade the region that applies.
Locus in geometry			**24A:** Drawing the locus of all points that are … away from a fixed point. Drawing the locus of all points that are … away from a line segment. Drawing the locus of all points equidistant from A and B (or … from A and … from B). See left for the possibilities.
Circles			**24B:** Given the equation for a circle, find its radius and centre. Given the centre of a circle and its radius, write the corresponding equation. Problems where you need to find the centre or the radius before writing the equation. Given the general form of the equation of a circle, use 'completing the square' to find its centre and radius. Given the general form and information about the circle, find the constant term. Finding the equation of a tangent to the circle (passing through a particular point). Word problems involving these.
Ellipses			**24C:** Given the foci A and B of an ellipse, and the value of AP + PB, be able to identify the locus of P as an ellipse. Given the same information, find the equation of the locus of P. Find where this curve cuts the axes, and sketch it. Given the axis intercepts of an ellipse, find the coordinates of its foci.
Other locus problems			**24D:** Problems using loci created by different constraints to those given above.
Matrices			

- The locus of all points which are equidistant from a fixed point is a circle.
- The locus of all points which are equidistant from a line segment has an athletics track shape with parallel sides and semi-circular ends.
- The locus of all points which are equidistant from two fixed points is the perpendicular bisector of the line segment joining the points.
- The locus of all points which are equidistant from a line is a pair of parallel lines.
- The locus of all points which are equidistant from a pair of parallel lines is a third parallel line midway between them.
- The locus of all points which are equidistant from two intersecting lines are the angle bisectors of the lines.



	Mathematics for the International Student 9 (MYP4)	**Pre-Diploma Studies SL (MYP 5)**	**Pre-Diploma S and HL (MYP 5 Plus) second edition**
Matrix size and construction	**18A:** Given a matrix, state its order. Identifying the element in a particular row/column. Given a scenario, construct a matrix or matrices to fit.		**20A:** Given a matrix, state its order. Identifying the element in a particular row/column. Given a scenario, construct a matrix or matrices to fit.
Matrix equality	**18B:** Given a pair of matrices, state why they are not equal. Given that a pair of matrices is equal, and some unknown elements in one or both matrices, find the unknown elements.		**20A:** Given a pair of matrices, state why they are not equal. Given that a pair of matrices is equal, and some unknown elements in one or both matrices, find the unknown elements.
Addition and subtraction of matrices	**18C:** Adding and subtracting matrices (up to order 3×3). Word problems involving these parameters.		**20B:** Adding and subtracting matrices (up to order 3×3).
Scalar multiplication	**18D:** Given a matrix **A**, find the scalar multiple k**A** (for some scalar k). Adding/subtracting matrices (where one or more of the matrices are multiplied by a scalar).Word problems using these parameters.		**20B:** Given a matrix **A**, find the scalar multiple k**A** (for some scalar k). Adding/subtracting matrices (where one or more of the matrices are multiplied by a scalar). ***Operations involving the zero matrix. Rearranging a matrix equation to make X the subject.***
Matrix multiplication	**18E:** Given two matrices (or their orders) state whether or not their product may be found, and explain why. Given two matrices (and the order in which they are multiplied), find the product. Word problems involving these parameters.		**20C:** Given two matrices (or their orders) state whether or not their product may be found, and explain why. Given two matrices (and the order in which they are multiplied), find the product. Word problems involving these parameters.
The determinant of a matrix			**20D:** Given a matrix, find the determinant (order 2×2 only). Given the coordinates of the vertices of a triangle, find its area (uses determinants). Word problems involving these.
Multiplicative identity and inverse matrices			**20E:** Given a matrix (order 2×2), find its inverse. Given a matrix expression involving inverses, simplify it.
Simultaneous equations (and matrices)			**20F:** Matrix equations ↔ simultaneous equations. Given an equation pair, solve simultaneously using matrices.
Linear transformations			**20G:** Using matrices to represent transformations. Using matrices to find the image points, given a set of object points. Given a point/equation and a rotation (up to 360° or 2π) about the origin O, give coordinates of the point or equation's image. Given a point/equation and a reflection in the line $y = [\tan \theta]x$, give coordinates of the point or equation's image. Determine the nature of a transformation, given its equations. Combining two transformations; finding the equivalent single
Proofs with 2×2 matrices			**20H:** Using matrix algebra to prove matrix facts.
Matrices using technology	**18F:** +, ×, ÷, − with matrices (including scalar multiples), using a calculator (so, can use large numbers, matrices larger than order 3×3). Word problems involving these parameters.		
Quadratic Functions			
Quadratic functions	**19A:** Identifying functions as quadratic or not quadratic. Given a quadratic function, find the value of y when x = … Given a point and a quadratic function, state whether the point lies on the function. Given a point (with unknown coordinate) and a quadratic function, find the unknown coordinate given that the point lies on the quadratic. Given a quadratic function, find the value of x when y = … Word problems involving these parameters.		**17A:** Identifying functions as quadratic or not quadratic. Given a quadratic function, find the value of y when x = … Given a point and a quadratic function, state whether the point lies on the function. Given a quadratic function, find the value of x when y = … Word problems involving these parameters.
Graphs of quadratic functions	**19B:** Given a quadratic function, create a table of values and hence draw the graph of the function.	**24A:** Given a quadratic function, create a table of values and hence draw the graph of the function.	**17B:** Given a quadratic function, create a table of values and hence draw the graph of the function.
Using transformations to sketch quadratics	**19C:** Given a quadratic, sketch its graph by applying transformations (translations, reflections, 'stretching/ compressing') to the basic quadratic function $y = x^2$.		**17B:** Given a quadratic, sketch its graph by applying transformations (translations, reflections, 'stretching/ compressing') to the basic quadratic function $y = x^2$.
Graphing by completing the square	**19D:** Given a quadratic function, write it in the form $y = (x - h)^2 + k$ by completing the square, and hence sketch the graph (stating the coordinates of the vertex).		**17B:** Given a quadratic function, write it in the form $y = (x - h)^2 + k$ by completing the square, and hence sketch the graph (stating the coordinates of the vertex).

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Axes intercepts	**19E:** Given a quadratic function find its *x*-intercepts and/or its *y*-intercept.	**24B:** Given a quadratic function find its *x*-intercepts and/or its *y*-intercept. ***Sketching the quadratic function using the axes intercepts.***	**17C:** Given a quadratic function find its *x*-intercepts and/or its *y*-intercept. Sketching the quadratic function using the axes intercepts.
Quadratic graphs	**19F:** Given the graph of a quadratic function, find its axis of symmetry. Given a quadratic function, find its axis intercepts, the equation of its axis of symmetry, and the coordinates of the vertex; and use these to sketch the graph of the function.	**24C:** Given a quadratic function, find its axis intercepts, the equation of its axis of symmetry, and the coordinates of the vertex; and use these to sketch the graph of the function.	**17D:** Given a quadratic function, find its axis intercepts, the equation of its axis of symmetry, and the coordinates of the vertex; and use these to sketch the graph of the function. ***Given the axis of symmetry and one of the x-intercepts, find the other x-intercept. Given the axes intercepts, sketch the graph and then find the axis of symmetry.***
Maximum and minimum values of quadratics (quadratic modelling, quadratic optimisation)	**19G:** Given a quadratic function, find the maximum/ minimum value and give the value of *x* at which it occurs. Word problems involving these parameters.	**24D:** Given a quadratic function, find the maximum/ minimum value and give the value of *x* at which it occurs. Word problems involving these parameters.	**17E:** Given a quadratic function, find the maximum/ minimum value and give the value of *x* at which it occurs. Word problems involving these parameters.
Other functions: their graphs and uses			
Exponential functions	**22A:** Given an exponential function in *x* and a value for *x*, find the corresponding value for *y*.		**16C:** Given an exponential function in *x* and a value for *x*, find the corresponding value for *y*. ***Completing a table of values. Using this to graph exponential functions. Given an exponential function and a transformation, find the image function.***
Graphing simple exponential functions	**22B:** Using an exponential graph to estimate the corresponding *x* for a given *y*, or vice versa. Using a calculator to check these estimations.		
Growth problems	**22C:** Given an exponential **growth** function, find the initial population; the corresponding '*y*' values for a series of '*x*' values, and use these to sketch a graph of the function. Use the graph to find the corresponding *x* for a given *y*, or vice versa.		**16D:** Given an exponential **growth** function, find the initial population; the corresponding '*y*' values for a series of '*x*' values, and use these to sketch a graph of the function.
Decay problems	**22D:** Given an exponential **decay** function, find the initial population; the corresponding '*y*' values for a series of '*x*' values, and use these to sketch a graph of the function. Use the graph to find the corresponding *x* for a given *y*, or vice versa.		**16D:** Given an exponential **decay** function, find the initial population; the corresponding '*y*' values for a series of '*x*' values, and use these to sketch a graph of the function.
Simple rational functions	**22E:** Given a rational function, explain why the function cannot take a particular real value. Given a rational function, find its asymptote(s). Given a rational function in *x* and a value for *x*, find the corresponding value for *y* (or vice versa). Using these, sketch the graph of a rational function. Word problems involving rational functions.		
Optimisation with rational functions	**22F:** Given a real-world scenario, construct and/or graph a rational function; use it to find the optimum point. Interpret this point for the scenario given.		
Unfamiliar functions	**22G:** Given a function, use technology to graph it. Find turning points, asymptotes, axes intercepts. Sketch the graph on paper using this information. Real-world problems using these.		
Vectors			
Vector representation	**23A:** Given a vector in component form, draw it on grid paper. Given a directed line segment on paper, write it in component form.		**15A:** Given a directed quantity and a scale, draw a directed line segment to represent it. **15E:** Given a vector in component form, draw it on grid paper. Given a directed line segment on paper, write it in component form. Given two points, give the vector connecting them in component form.
Lengths of vectors	**23B:** Using Pythagoras' Theorem to find the length/ magnitude of a vector. Using the length formula to find the length of a vector. Word/geometrical problems involving this.		**15E:** Using the distance formula to find the length of a vector.

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Equal vectors	**23C:** Given a pair of vectors state why they are not equal. Given that a pair of vectors is equal, and some unknown elements in one or both vectors, find the unknown elements. Geometrical problems using equal vectors.		**15B:** Identifying equal vectors (or parallel, negative, equal magnitude, same direction). Geometrical problems using equal vectors.
Vector addition	**23D:** Adding up to three vectors. Given a vector diagram, write a vector equation connecting the vectors. Given a vector diagram, find a specified vector in terms of the other vectors in the diagram. Word problems involving these.		**15C:** Given two vectors on grid paper, show how to find **a** + **b**. Given a vector diagram, find a specified vector in terms of the other vectors in the diagram. Word problems involving these. **15E:** Adding vectors in component form.
Scalar multiplication	**23E:** Given a vector **a**, find the scalar multiple *k***a** (for some scalar *k*). Given a vector **a**, draw the scalar multiple *k***a** (for some scalar *k*) on grid paper. Problems involving the zero		**15F:** Given a vector **a**, find the scalar multiple *k***a** (for some scalar *k*) using geometrical methods; checking using component form arithmetic.
Vector subtraction	**23F:** Given a vector, write its opposite (negative) vector. Subtracting one vector from another, using a diagram. Subtracting one vector from another using algebraic methods.		**15D:** Subtracting one vector from another, using a diagram. Word problems involving these. **15E:** Subtracting vectors in component form.
The direction of a vector	**23G:** Given a vector, find its (true) bearing. Given a speed and a bearing, find the velocity vector.		
Problem solving by vector addition	**23H:** Real-world problems (involving displacement, velocity) that require the construction of a vector diagram (or the use of vector methods).		
Vector equations			**15G:** Given a vector equation, rearrange to make another vector the subject. Given a vector equation and all but one vector, find the value of the remaining vector.
Parallelism of vectors			**15H:** Given that two vectors are parallel (and one or both vectors has an element 'blanked out'), find the missing components. Word problems involving this.
The scalar product of two vectors			**15I:** Given two vectors, find their scalar product. Given that two vectors are perpendicular, use the scalar product to find unknown components. Given three points, find the angle described by them. Given the equations for two lines, find the angle between them. Using the dot product to verify vector
Vector proof			**15J:** Using vector facts to prove mathematical statements involving vectors.
Non-right angled triangle trigonometry			
Obtuse angles	**25B:** Using a unit half-circle diagram to find the sine/ cosine/tangent of obtuse angles. Finding the obtuse angle with the same sine as a specified acute angle (or vice versa).	**26A:** Find the sine/ cosine/tangent of obtuse angles. Finding the obtuse angle with the same sine as a specified acute angle (or vice versa).	
Area of a triangle using sine	**25C:** Given two sides of a triangle and the included angle, find the triangle's area. Given the area and two of the sides, find the included angle.	**26B:** Given two sides of a triangle and the included angle, find the triangle's area. Given the area and two of the sides, find the included angle.	**10E:** Given two sides of a triangle and the included angle, find the triangle's area. Given the area and two of the sides, find the included angle.
The sine rule	**25D:** Using the sine rule to find unknown lengths. Using the sine rule to find unknown angles.	**26C:** Using the sine rule to find unknown lengths. Using the sine rule to find unknown angles. ***Finding angles given an accurate diagram. Finding angles without an accurate***	**10F:** Using the sine rule to find unknown lengths. Using the sine rule to find unknown angles (including the ambiguous case).
The cosine rule	**25E:** Given two sides and the included angle, use the cosine rule to find the length of the remaining side. Given all three sides, use the cosine rule to find an unknown angle.	**26D:** Given two sides and the included angle, use the cosine rule to find the length of the remaining side. Given all three sides, use the cosine rule to find an unknown angle.	**10G:** Given two sides and the included angle, use the cosine rule to find the length of the remaining side. Given all three sides, use the cosine rule to find an unknown angle.
Problem solving with the sine and cosine rules	**25F:** Word problems based on problems in 25D and 25E.	**26E:** Word problems based on problems in 26C and 26D.	**10H:** Word problems based on problems in 10F and 10G.
Trigonometric identities			**10I:** Using trigonometric identities to simplify expressions (expressions may involve expand[illegible] simplifying; see below for what may be used).
Variation			

- $\sin^2\theta + \cos^2\theta$ could be replaced by 1
- 1 could be replaced by $\sin^2\theta + \cos^2\theta$
- $\sin^2\theta$ could be replaced by $1 - \cos^2\theta$
- $1 - \cos^2\theta$ could be replaced by $\sin^2\theta$
- $\cos^2\theta$ could be replaced by $1 - \sin^2\theta$
- $1 - \sin^2\theta$ could be replaced by $\cos^2\theta$

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Direct variation	**26A:** Identifying whether two variables are directly proportional. Given that two variables are directly proportional, state what happens to the second variable if the first one is multiplied/divided by … Finding the proportionality constant, given a table of values. Given a graph, state whether the variables are directly proportional. Word problems using these parameters. Same types of problems, but considering the relationship between v and x^2, or v and $\sqrt{x}$ say.		
Inverse variation	**26B:** Given a table of values, determine whether x and y are inversely proportional. Given a graph, state whether the variables are inversely proportional. Finding the proportionality constant, and hence finding the value of x when y = … (or vice versa). Word problems involving these parameters.		
Two variable analysis			
Correlation	**27A:** Given a scatterplot, state whether there is positive, negative, or no association between the variables (and how strong it is). Given a scatterplot, state whether the relationship between variables appears to be linear. The scatterplot may be given to you or you may have to produce it from a table of values. Interpreting these results.		
Pearson's correlation coefficient, r	**27B:** Given a set of points, calculate r using the formula, and interpret the result. Using technology to draw a scatterplot and hence calculate r and r^2; and interpret the result.		
Line of best fit by eye	**27C:** Given a data set, create a scatterplot and draw in the line of best fit by eye. Using this line of best fit to predict values.		
Linear regression	**27D:** Using technology to draw a scatterplot and find the line of best fit (using linear regression). Using the regression line to predict values.		
Logic			
Propositions	**28A:** Identifying propositions. Writing propositions. Writing statements that are not propositions. Given a proposition, write its negation.	**3H:** Identifying propositions. Writing propositions. Given a proposition, write its negation.	
Compound statements	**28B:** Given two propositions, write the **conjunction**. Given two propositions, write the **disjunction.** Given two propositions, write an **implication** linking them. Given an implication statement, write it in words. Given a pair of propositions, write an **equivalence** proposition for them.	**3H:** Given two propositions, write the **conjunction**. Given two propositions, write the **disjunction.**	
Constructing truth tables	**28C:** Given a composite proposition, construct a truth table. Using a truth table to identify tautologies, and contradictions.	**3H:** Given a composite proposition, construct a truth table. ***Using a truth table to identify logically equivalent compound statements.***	
Functions			
Mappings		**20F:** Given a 'sets and mappings' diagram, complete it and hence state whether the relationship is one-one, one-many, many-one or many-many. Given a domain and a mapping, describe the corresponding range.	
Functions		**20G:** Given the domain of a function (and the function), find the range (includes using a calculator to help graph the function). Given the graph of a function, state its domain and range. Given the domain and range of a function, find what the function is.	**14A:** Given a set of points, state the domain and range. Given a graph, state its domain and range. **14B:** Given a set of ordered pairs, determine whether or not it is a function. Given a graph of a relation, determine whether or not it is a function.

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Function notation		**20H:** Given a function $f(x)$ and a value, a, find and interpret $f(a)$. Given that a function $f(x) = a$, find the corresponding *x*. Word problems involving this.	**14C:** Given a function $f(x)$ and a value, a, find and interpret $f(a)$. Word problems involving this. ***Finding the domain of functions that have the square root of an algebraic expression in them.***
Composite functions			**14D:** Given functions $f(x)$ and $g(x)$, find various composite functions.
Transforming $y = f(x)$			**14E:** Given a function and a transformation, find the image equation.
Inverse functions			**14F:** Given a function, find the inverse function and plot them both (along with the graph of $y = x$) on the same set of axes. Given a graph, copy it and draw the graph of the inverse function. Given a graph, determine whether the graph has an inverse function.
The modulus function			**14G:** Given a modulus expression and a value for *x*, find the value of the expression. Investigating properties of modulus. Solving modulus equations.
Advanced trigonometry			
Radian measure			**18A:** Radians ↔ degrees (may need to use a calculator).
Trigonometric ratios from the unit circle			**18B:** Using a unit circle diagram to find the sine and cosine of any angle (in degrees or in radians) Given the sine or cosine and the quadrant the angle lies in, find the other ratio.
Multiples of 30° and 45°			**18C:** Using the symmetry of the unit circle to find sin/cos/tan of multiples of 30° and 45°. Given the value of sin θ, cos θ or tan θ and the domain of θ, find the value of θ. Using a graph of $y = \sin\theta$ or $y = \cos\theta$ to estimate sin θ and cos θ for a particular value of θ.
Graphing trigonometric functions			**18D:** Sketching the graphs of functions using sine and cosine, using the basic function and transformations (and **without** using technology). Given the function, find the period.
Modelling with sine functions			**18E:** Given a table of values, fit a sine model to the data without using technology. Given a scenario, devise a sine model to fit.
Trigonometric equations			**18F:** Solving trigonometric equations in sin θ, cos θ or tan θ. Solving trigonometric equations where some rearranging is necessary (usually over $0 \le \theta \le 2\pi$).
Negative and complementary angle formulae			**18G:** Using negative/complementary angle formulae to simplify trigonometric expressions.
Addition formulae			**18H:** Using addition formulae to simplify trigonometric expressions.
Introduction to calculus			
Estimating gradients of tangents to curves			**22A:** Given a graph of a function (on grid paper), draw the tangent to the curve at a particular point and estimate its gradient.
Gradients using quadratic theory			**22B:** Using quadratic theory to find the gradient of a tangent to a quadratic or a simple rational function (assume the tangent has the form $y = mx + c$).
Gradients using limit theory			**22C:** Using the limit method to find the gradient of a tangent to a function (at a particular point).

	Mathematics for the International Student 9 (MYP4)	Pre-Diploma Studies SL (MYP 5)	Pre-Diploma S and HL (MYP 5 Plus) second edition
Differentiation			**22D:** Using first principles to find the derivative of functions (powers of *x*, polynomials in *x)*. Using the differentiation rules to find the derivative of functions (powers of *x*, polynomials in *x*, roots in *x*).
Optimisation			**22E:** Using differentiation (and sign diagrams) to find the maximum/minimum value of a function and where it occurs. Word problems involving this.
Areas under curves			**22F:** Finding the shaded area under a curve, using rectangular strips. Also using areas of rectangles and triangles.
Integration			**22G:** Finding the antiderivative of functions (powers of *x*, polynomials in *x*). Using the rules for integration (powers of *x*, polynomials in *x*, roots of *x*)
The definite integral			**22H:** Calculating the definite integral. Finding the area bounded by two vertical lines, the function and the *x*-axis.
Counting and Probability			
The product and sum principles			**23A:** Using the product and sum principles to count the number of different possibilities in a scenario.
Counting permutations			**23B:** Given a set of objects, find how many ways you can pick *n* of them (order matters!)
Factorial notation			**23C:** Simplifying numeric expressions involving factorials. Writing an expression as a factorial. Given an equation in *n* (involving factorials), find *n*.
Counting with combinations			**23D:** Given a set of objects, find how many ways you can pick *n* of them (order **doesn't** matter). Using the combination formula C_r^n. Word problems involving this.
Probabilities using permutations and combinations			**23E:** Using permutations and combinations to help calculate probabilities.
The hypergeometric distribution			**23F:** Using the hypergeometric distribution to calculate probabilities.