

Term	Unit	Ref	Topic	GCSE Objective statement	Hegarty
Autumn Year 10	1 Calculations 1 * (Number)	1.1 *	Place value and rounding scheme C	Order positive and negative integers, decimals ; use the symbols =, ≠, <, >, ≤, ≥. Apply the four operations (+, -, ×, ÷); understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals). Use standard units of mass, length, time, money, and other measures using decimal quantities where appropriate. Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures).	46 56, 130, 131, 132
		1.2 *	Adding and subtracting scheme C	Apply the operations (+, -), including formal written methods, to integers, decimals – all both positive and negative; understand and use place value (e.g. when calculating with decimals). Use standard units of money using decimal quantities where appropriate	47
		1.3 *	Multiplying and dividing scheme C	Apply the operations (×, ÷), including formal written methods, to integers, decimals and all both positive and negative; understand and use place value (e.g. when calculating with decimals). Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. Use standard units of length, time, money, and other measures (including standard compound measures) using decimal quantities where appropriate.	143, 22
	2 Expressions (Algebra)	2.1*	Simplifying expressions SCHEME C and D	Use and interpret algebraic notation, including: - ab in place of a × b - 3y in place of y + y + y and 3 × y - a ² in place of a × a, a ³ in place of a × a × a, a ² b in place of a × a × b - a/b in place of a÷b - coefficients written as fractions rather than as decimals Substitute numerical values into formulae and expressions, including scientific formulae. Understand and use the concepts and vocabulary of expressions, equations, formulae, terms Simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by: - collecting like terms - simplifying expressions involving sums, products and powers,	156, 157
		2.2 *	Indices SCHEME D and E	Simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by: - collecting like terms - simplifying expressions involving sums, products and powers, including the laws of indices.	102, 103, 104, 105, 106, 107,
		2.3	Expanding and factorising 1 SCHEME E	Use and interpret algebraic notation, including: - ab in place of a × b - 3y in place of y + y + y and 3 × y - a ² in place of a × a, a ³ in place of a × a × a, a ² b in place of a × a × b - a/b in place of a ÷ b - coefficients written as fractions rather than as decimals - brackets. Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors. Simplify and manipulate algebraic expressions) by: - collecting like terms - multiplying a single term over a bracket - taking out common factors - simplifying expressions involving sums, products and powers, including the laws of indices. - expanding products of two or more binomials - factorising quadratic expressions of the form x ² + bx + c, including the difference of two squares; factorising quadratic expressions of the form ax ² + bx + c	160, 161 162, 163, 164, 165, 166 168, 169, 171, 173

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		2.4	Algebraic fractions SCHEME D & E	Apply the four operations (+, -, ×, ÷), including formal written methods, to simple fractions Simplify and manipulate algebraic expressions involving algebraic fractions by: - collecting like terms - multiplying a single term over a bracket - taking out common factors - simplifying expressions involving sums, products and powers, including the laws of indices	170, 172, 229
		10.1	Solving linear equations SCHEME C and D	Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, and reciprocals. Understand and use the concepts and vocabulary of expressions, equations, terms. Simplify and manipulate algebraic expressions (including those involving algebraic fractions) by: - collecting like terms - multiplying a single term over a bracket - simplifying expressions involving sums, products - expanding products of two binomials Understand and use standard mathematical formulae; rearrange formulae to change the subject. Solve linear equations in one unknown algebraically including those with the unknown on both sides of the equation; find approximate solutions using a graph. Translate simple situations or procedures into algebraic expressions or formulae; derive an equation, solve the equation and interpret the solution.	178 to 188
	3 Angles and polygons (Geometry)	3.1*	Angles and lines SCHEME C	Use conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive the sum of angles in a triangle and use of bearings.	477, 478, 812, 813, 814, 815, 479, 480, 481, 482, 483,
		3.2*	Triangles and quadrilaterals SCHEME C	Derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language. Apply angle facts, properties of quadrilaterals to conjecture and derive results about angles and use known results to obtain simple proofs. Solve geometrical problems on coordinate axes.	484, 485, 486, 487, 488, 489, 490, 491, 822
		3.3	Congruence and similarity SCHEME D	use the standard conventions for labelling and referring to the sides and angles of triangles; Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS). Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs. Apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures.	680, 681, 682,
		3.4*	Polygon angles SCHEME C	Deduce and use the angle sum in any polygon, and to derive properties of regular polygons including exterior and interior angles	560, 561, 562,

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	4 Handling data 1 (Statistics)	4.1*	Representing data SCHEME C	Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling. Interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts, vertical line charts for ungrouped discrete numerical data, and know their appropriate use. Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: - appropriate graphical representation involving discrete data,	394, 425,
		4.2*	Averages and spread 1 SCHEME C	Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: - appropriate measures of central tendency (median, mean, mode) and spread (range, including consideration of outliers, quartiles and inter-quartile range). Apply statistics to describe a population.	405, 406, 407, 408 409, 410, 411, 412,
		4.3	Frequency diagrams	Interpret and construct tables, charts and diagrams, including frequency tables, bar charts, and know their appropriate use. Construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals, and know their appropriate use. Interpret, analyse the distributions of data sets from univariate empirical distributions through: - appropriate graphical representation involving discrete, continuous and grouped data, modal class	414, 415, 416, 417, 418, 419, 420, 421 442 to 449
	5 Fractions, decimals and percentages (Number)	5.1*	Fractions and percentages SCHEME C	Interpret fractions and percentages as operators. Define percentage as 'number of parts per hundred'; interpret percentages as a fraction or a decimal, and interpret these multiplicatively	59, 73, 74, 75, 76,
		5.2*	Calculations with fractions SCHEME B, C and D	Order fractions; use the symbols =, ≠, <, >, ≤, ≥. Apply the four operations, including formal written methods, to simple fractions (proper and improper), and mixed numbers Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, and reciprocals.	63, 64 66, 67, 68, 69, 70, 71, 72
		5.3	Fractions, decimals and percentages SCHEME E	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 or 3/8). Change recurring decimals into their corresponding fractions and vice versa. Define percentage as 'number of parts per hundred'; interpret percentages as a fraction or a decimal; express one quantity as a percentage of another; compare two quantities using percentages;	53, 54
	6 Formulae and functions (Algebra)	6.1	Formulae SCHEME C	Substitute numerical values into formulae and expressions, including scientific formulae. Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, terms and factors. Understand and use standard mathematical formulae; rearrange formulae to change the subject. Change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure) in algebraic contexts.	780 to 789 280 to 286 691 to 712
		6.2	Functions SCHEME D	Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. Where appropriate, interpret simple expressions as functions with inputs and outputs; interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'.	288, 289, 293, 294, 295, 296
		6.3	Equivalences in algebra	Know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments and proofs.	154



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		6.4	Expanding and factorising 2 SCHEME E	Simplify and manipulate algebraic expressions (including those involving algebraic fractions) by: - collecting like terms - taking out common factors - simplifying expressions involving sums, products and powers, - expanding products of two or more binomials - factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares; factorising quadratic expressions of the form $ax^2 + bx + c$	162 to 166 223 to 228



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Spring Year 10	7 Working in 2D (Geometry)	7.1*	Measuring lengths and angles SCHEME C	Change freely between related standard units (e.g. length) in numerical contexts. Use scale factors, scale diagrams and maps. draw diagrams from written description. Use standard units of measure and related concepts (length) Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings.	864 to 868 492 to 496
		7.2*	Area of a 2D shape SCHEME B	Understand and use standard mathematical formulae; rearrange formulae to change the subject. Use standard units of measure and related concepts (length, area.) Know and apply formulae to calculate: area of triangles, parallelograms, trapezia;	555, 556, 557, 558, 559
		7.3	Transformations 1 SCHEME C, D and E	Identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including fractional scale factors). Describe the changes and invariance achieved by combinations of rotations, reflections and translations. Solve geometrical problems on coordinate axes. Describe translations as 2D vectors.	637 to 649
		7.4	Transformations 2 SCHEME E	Identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including fractional and negative scale factors).	650 to 654
	8 Probability (Probability)	8.1	Probability experiments SCHEME C and D	Record describe and analyse the frequency of outcomes of probability experiments using tables. Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments. Relate relative expected frequencies to theoretical probability, using appropriate language and the 0 - 1 probability scale. Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling.	368, 369 356, 355
		8.2	Theoretical probability SCHEME D	Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size	351, 352,
		8.3*	Mutually exclusive events SCHEME C	Apply the property that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one.	353, 354
	9 Measures and accuracy (Number)	9.1	Estimation and approximation SCHEME E	Apply the four operations (+, -, ×, ÷), including formal written methods, to decimals understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals). Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. Use positive integer powers and associated real roots (square), estimate powers and roots of any given positive number. Estimate answers; check calculations using approximation and estimation, including answers obtained using technology. Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures).	112, 131,
		9.2	Calculator methods SCHEME D	use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. BIDMAS Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures). Change freely between related standard units (e.g. time) and compound units (e.g. speed) in numerical contexts.	129



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		9.3	Measures and accuracy SCHEME D	Use standard units of mass, length, time and other measures (including standard compound measures) using decimal quantities where appropriate. Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures). Use inequality notation to specify simple error intervals due to truncation or rounding. Apply and interpret limits of accuracy, including upper and lower bounds.	774 to 777

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Summer Year 10	10 Equations and inequalities (Algebra)	10.1	Covered earlier in the year		
		10.2	Quadratic equations SCHEME E	Simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by: - collecting like terms - multiplying a single term over a bracket - taking out common factors - simplifying expressions involving sums, products and powers, - expanding products of two binomials - factorising quadratic expressions of the form $x^2 + bx + c$, factorising quadratic expressions of the form $ax^2 + bx + c$ deduce roots algebraically; Solve quadratic equations (including those that require rearrangement) algebraically by factorising; by completing the square and by using the quadratic formula; find approximate solutions using a graph.	230 to 242
		10.3	Simultaneous equations SCHEME E	Solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically; find approximate solutions using a graph. Translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution.	190 to 195 218, 219 246, 259
		10.4	Approximate solutions	Use positive integer powers and associated real roots (square, cube and higher) Substitute numerical values into formulae and expressions Understand and use standard mathematical formulae; rearrange formulae to change the subject. Find approximate solutions to equations numerically using iteration.	321, 322,
		10.5	Inequalities	Understand and use the concepts and vocabulary of expressions, equations, inequalities Solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph.	265 to 276
	11 Circles and constructions (Geometry)	11.1	Circles 1 SCHEME C	Understand and use standard mathematical formulae; rearrange formulae to change the subject. Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment. Know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2 ; calculate perimeters of 2D shapes, including circles; areas of circles and composite shapes.	534 to 543
		11.2	Circles 2 SCHEME D & E	Calculate arc lengths, angles and areas of sectors of circles.	544 to 547
		11.4	Constructions and loci SCHEME D	Use scale factors, scale diagrams and maps. Use conventional terms and notations: points, lines, vertices, parallel lines, perpendicular lines, right angles, draw diagrams from written description. Use the standard ruler and compass constructions: perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point bisecting a given angle use these to construct given figures and solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line. Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings.	659 to 669 674 to 679



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	12 Ratio and proportion (Ratio and proportion)	12.1	Proportion SCHEME C	Express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1. Define percentage as 'number of parts per hundred'; interpret percentages as a fraction or a decimal, and interpret these multiplicatively; express one quantity as a percentage of another; compare two quantities using percentages; work with percentages greater than 100%;	84 to 87 97, 98
		12.2	Ratio and scales SCHEME C	Identify and work with fractions in ratio problems. Use scale factors, scale diagrams and maps. Use ratio notation, including reduction to simplest form. Divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations). Express a multiplicative relationship between two quantities as a ratio Understand and use proportion as equality of ratios. Relate ratios to fractions Compare lengths, using ratio notation; make links to scale factors.	328 to 338
		12.3	Percentage change SCHEME C & D	Define percentage as 'number of parts per hundred'; interpret percentages and percentage changes as a fraction or a decimal, and interpret these multiplicatively; express one quantity as a percentage of another; compare two quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease and original value problems, and simple interest including in financial mathematics.	96, 93

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Autumn Year 11	13 Factors, powers and roots (Number)	13.1*	Factors and multiples SCHEME B	Use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem. Apply systematic listing strategies Enumerate sets and combinations of sets systematically, using Venn diagrams	27 to 32 33 to 36
		13.2*	Powers and roots SCHEME D	Apply systematic listing strategies including use of the product rule for counting. Use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5; estimate roots of any given positive number. Calculate with roots, and with integer indices;	671 to 673 99 to 110
		13.3	Surds	Calculate exactly with surds ; simplify surd expressions involving squares (e.g. $\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$) and rationalise denominators.	111 to 119
	14 Graphs 1 (Algebra)	14.1	Equation of a straight line SCHEME C and E	Understand and use standard mathematical formulae; rearrange formulae to change the subject. Work with coordinates in all four quadrants. use the form $y = mx + c$ to identify parallel lines; use the form $y = mx + c$ to identify perpendicular lines; find the equation of the line through two given points, or through one point with a given gradient. Identify and interpret gradients and intercepts of linear functions graphically and algebraically. Express a multiplicative relationship between two quantities as a ratio or a fraction. Relate ratios to fractions and to linear functions. Interpret the gradient of a straight line graph as a rate of change;	201 to 204 206 to 216
		14.2	Linear and quadratic functions SCHEME E	Plot graphs of equations that correspond to straight-line graphs in the coordinate plane; Recognise, sketch graphs of linear functions and quadratic functions, find approximate solutions using a graph.	205, 251 to 257
		14.3	Properties of quadratic functions SCHEME E	Identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically; deduce turning points by completing the square. Recognise, sketch and interpret graphs of quadratic functions, Solve quadratic equations algebraically by factorising; by completing the square find approximate solutions using a graph.	251 - 257, 260
		14.4	Kinematic graphs SCHEME C	Plot and interpret graphs ; graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration.	300 - 302 874 - 879 880 - 882
	15 Working in 3D (Geometry)	15.1*	3D shapes Scheme B	Use conventional terms and notations: vertices, edges, draw diagrams from written description. Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres. Construct and interpret plans and elevations of 3D shapes.	829 - 844
		15.2	Volume of a prism SCHEME D & E	Use compound units such as density Compare lengths, areas and volumes make links to scale factors. Use standard units of measure and related concepts (length, area, volume/capacity, mass, time, etc.) Know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volume of cuboids and other right prisms (including cylinders). Know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2 ; calculate areas of circles and composite shapes.	570 - 575
		15.3	Volume and surface area Scheme E	Surface area and volume of spheres, pyramids, cones and composite solids. Apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures.	576 - 583 584 - 591



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	17 Calculations 2 (Number)	17.1	Calculating with roots and indices	Use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5; Calculate with roots, and with integer indices; calculate with fractional indices. Simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by: - collecting like terms - simplifying expressions involving sums, products and powers, including the laws of indices.	104, 108, 109
		17.2	Exact calculations	Calculate exactly with fractions; calculate exactly with multiples of π ; calculate exactly with surds; simplify surd expressions involving squares (e.g. $\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$) and rationalise denominators. Simplify and manipulate algebraic expressions (including those involving surds) by: - collecting like terms - multiplying a single term over a bracket Solve two simultaneous equations involving surds or pi in two variables (linear/linear or linear/quadratic) algebraically;	542
		17.3	Standard form SCHEME E	Apply the four operations (+, -, \times , \div) with and interpret standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer. Convert numbers into and out of standard form	121 to 128
	19 Pythagoras, trigonometry and vectors (Geometry)	19.1	Pythagoras' theorem SCHEME D & E	Know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$; apply to find lengths in right-angled triangles calculate exactly with surds; simplify surd expressions involving squares (e.g. $\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$) Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including Pythagoras' Theorem and use known results to obtain simple proofs. Solve geometrical problems on coordinate axes.	497 to 507
		19.2	Trigonometry 1 SCHEME E	Know the formulae for the trigonometric ratios: $\sin \theta = \text{opposite/hypotenuse}$, $\cos \theta = \text{adjacent/hypotenuse}$ and $\tan \theta = \text{opposite/adjacent}$; apply them to find angles and lengths in right-angled triangles and, where possible, general triangles in two dimensional figures. Know the exact values of $\sin \theta$ and $\cos \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° ; know the exact value of $\tan \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and 60° .	508 to 515
		19.3	Trigonometry 2	Know and apply the sine rule, $a/\sin A = b/\sin B = c/\sin C$ and cosine rule, $a^2 = b^2 + c^2 - 2bc \cos A$, to find unknown lengths and angles.	516 to 519 520 to 533
		19.4	Pythagoras and trigonometry problems	Apply Pythagoras' theorem, trigonometry ratio, sine and cosine rules to various problems	see previous
		19.5	Vectors SCHEME E	Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors. Use vectors to construct geometric arguments and proofs.	650 623 to 636



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Spring Year 11	21 Sequences (Algebra)	21.1	Linear sequences SCHEME D	Generate terms of a sequence from either a term-to-term or a position-to-term rule. Recognise and use , simple arithmetic progressions, Deduce expressions to calculate the nth term of linear sequences	196 to 198
		21.2	Quadratic sequences	Generate terms of a sequence from either a term-to-term or a position-to-term rule. Recognise and use quadratic sequences and other sequences. Deduce expressions to calculate the nth term of linear sequences and quadratic sequences.	247 to 250
		21.3	Special sequences	Generate terms of a sequence from either a term-to-term or a position-to-term rule. Recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (r^n where n is an integer, and r is a rational number > 0 or a surd) and other sequences.	263, 261,
	16 Handling data 2 (Statistics)	16.1	Averages and spread 2	Interpret and construct tables, charts including frequency tables, and know their appropriate use. Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: - appropriate measures of central tendency (median, mean, mode and modal class) and spread (range). Apply statistics to describe a population.	414 to 418
		16.2	Box plots and cumulative frequency graphs	Construct and interpret diagrams for grouped discrete data and continuous data, i.e.cumulative frequency graphs, and know their appropriate use. Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: - appropriate graphical representation involving discrete, continuous and grouped data, including box plots. - appropriate measures of central tendency (median) and spread (range, quartiles and inter-quartile range).	434 to 440
		16.3	Scatter graphs and correlation SCHEME D	Use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing.	452 to 453
		16.4	Time series	Interpret and construct tables, charts and diagrams, including , tables and line graphs for time series data and know their appropriate use.	450
	18 Graphs 2 (Algebra)	18.1	Cubic and reciprocal functions	Recognise, sketch and interpret graphs of linear functions and quadratic functions, simple cubic functions and the reciprocal function $y = 1/x$ with $x \neq 0$,	
		18.2	Exponential and trigonometric functions	Recognise, sketch and interpret graphs of, exponential functions $y = k^x$ for positive values of k, and the trigonometric functions (with arguments in degrees) $y = \sin x$, $y = \cos x$ and $y = \tan x$ for angles of any size. Sketch translations and reflections of a given function.	302, 303, 304, 305, 306 307 to 313
		18.3	Real-life graphs	Plot and interpret graphs (including reciprocal graphs and exponential graphs) in real contexts and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration. Interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion.	894 to 902
		18.4	Gradients and areas under graphs	Calculate or estimate gradients of graphs (including quadratic and other non-linear graphs) and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts.	891 to 893
		18.5	Equation of a circle	Recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given point.	315 to 317
	11 Circle Theorems	11.3	Circle theorems	Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results.	594 to 606 816 to 820

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Summer Year 11	20 The probability of combined events (Probability)	20.1	Sets SCHEME E	Apply the property that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one. Enumerate sets and combinations of sets systematically, using Venn diagrams Calculate the probability of independent and dependent combined events, including using other representations, and know the underlying assumptions.	370 to 380 358 to 359	
		20.2	Possibility spaces	Apply systematic listing strategies including use of the product rule for counting. Enumerate sets and combinations of sets systematically, using tables, grids Construct theoretical possibility spaces for single experiments with equally likely outcomes and use these to calculate theoretical probabilities. Construct theoretical possibility spaces for combined experiments with equally likely outcomes and use these to calculate theoretical probabilities.		
		20.3	Tree diagrams SCHEME E	Record describe and analyse the frequency of outcomes of probability experiments using frequency trees. Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments. Apply the property that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one. Enumerate sets and combinations of sets systematically, using tree diagrams. Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions.	361 to 363	
		20.4	Conditional probability SCHEME E	Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams, and Venn diagrams.	364 to 367, 423	
	22 Units and proportionality (Ratio and proportion)		22.1	Compound units	Change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts. Use compound units such as speed, rates of pay, unit pricing, density and pressure.	715 to 738
			22.2	Converting between units	Compare lengths, areas and volumes using ratio notation; make links to similarity and scale factors. Apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures	608 to 621
			22.3	Direct and inverse proportion	Solve problems involving direct and inverse proportion, including graphical and algebraic representations. Understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y; construct and interpret equations that describe direct and inverse proportion. Interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion.	339 to 348
			22.4	Rates of change	Interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts.	890
			22.5	Growth and decay	Interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion. Set up, solve and interpret the answers in growth and decay problems, including compound interest and work with general iterative processes.	94, 95