YEAR 9 HALF TERM 1 MATHEMATICS SETS 1-2 LEARNING PROGRAMME

Love God
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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Proportion	Be able to represent proportion in a variety of ways Work with direct proportion Work with inverse proportion	Compare, comparison Multiplier Constant Coefficient Linear Ratio Proportion	1) Recapping what proportion is and using the unitary method 2) Exploring different representations of proportion 3) Developing the understanding of the multiplier and as a result the formula (link to graphs using x and y) 4) Obtaining the algebraic formula with direct proportion introducing k and α 5) Using k and α to calculate information involving direct proportion 6) End of unit assessment	Multiplying integers and decimals Plotting graphs of linear functions Substitution into algebraic expressions	One written and one retrieval piece on proportion
Rearranging formulae more complex	Be able to rearrange a variety of formulae	Formula, Formulae Variable Term Coefficient Power Indices Subject	1) Rearranging formulae recap 2) Rearranging formulae involving fractions 3) Rearranging formulae involving indices 4) Rearranging formulae with 3 or more inverse operations 5) A mixture of questions involving rearranging formulae	Understanding inverse functions, including powers and roots Solving equations Expanding brackets	One written and one retrieval piece on rearranging formulae

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Indices	Recap basic laws of indices Work with negative and fractional indices Work with indices and algebra	Power Root Index, Indices Positive Negative	1) Recapping indices including substitution with indices 2) Problems involving indices 3) Negative indices 4) Negative indices including coefficients 5) Fractional indices exploring patterns 6) Calculating with fractional indices 7) Calculating with fractional, negative and positive indices 8) Indices involving algebra	Basic laws of indices Cancelling fractions by identifying common factors Powers and roots	One written and one retrieval piece on indices

Revision Date: 05 August 2022

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Pythagoras and Trigonometry	Calculate with Pythagoras' theorem Understand the Trigonometric ratios Use the Trigonometric ratios to calculate sides and angles on right angled triangles Use trigonometry and Pythagoras with bearings	Pythagoras' theorem Right angle Square root Sine Cosine Tangent Opposite Adjacent Hypotenuse Elevation Depression Bearing	1) Recap Pythagoras 2) 3D Pythagoras 3) Exploring the ratios 4) Labelling the triangle and picking a ratio (no calculating) 5) Calculating angles 6) Calculating missing sides 7) Calculating missing sides 8) Calculating angles and sides using trig 9) Angles of elevation and depression 10) Working with right angled triangles (pythag and trig) 11) Bearings and right angled triangles	Applying Pythagoras' Theorem to right-angled triangles Understand and work with similar shapes Solve linear equations Rearranging formulae Angles on parallel lines	One written and one retrieval piece on Pythagoras and trigonometry

YEAR 9 **HALF TERM 2** **MATHEMATICS SETS 1-2** **LEARNING PROGRAMME**

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Recurring decimals and fractions	Understand the relationship between fractions decimals and percentages Convert between fractions and decimals Convert recurring decimals to fractions	Mixed number Improper fraction Decimal Terminating Recurring Simplify, Cancel	1) investigation around fractions and decimals, identifying recurring and terminating explorative 2) Converting fractions to decimals 3) Converting fractions to recurring decimals 4) GCSE style questions	Identify if a fraction is terminating or recurring Move freely between terminating fractions, decimals and percentages Use a multiplier to calculate the result of percentage changes	One written and one retrieval piece on decimals
Cumulative frequency and box plots	Calculate averages Understand quartiles and box plots Understand, plot and use cumulative frequency curves Link and calculate with cumulative frequency curves and box plots	Discrete data Continuous data Axis, axes Sample Cumulative frequency Box plot Central tendency Mean, median, mode Spread Range, Interquartile range Skewness	1) Recapping averages 2) Quartiles and box plots from listed data 3) Comparing box plot 4) Drawing cumulative frequency curve 5) Cumulative frequency curve and box plot 6) Interpreting box plots and cf curves 7) CF box plots and proportion 8) Averages and quartiles from stem and leaf 9) End of unit assessment	Know the meaning of discrete and continuous data Understand coordinates and plot graphs Interpret and construct frequency tables Analyse data using measures of central tendency	One written and one retrieval piece on cumulative frequency and box plots.

YEAR 9 HALF TERM 2 MATHEMATICS SETS 1-2 LEARNING PROGRAMME

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
More complex expanding and factorising	Expand and factorise quadratics Expand triple brackets Quadratic graphs and linking them to equations	Product Expand Linear Quadratic Variable Coefficient Common factor Factorise Power Indices	1) Expanding and factorising with difference of 2 squares including application questions 2) Expanding triple brackets 3) Full factorising recap 4) GCSE style problems involving factorising 5) Solving using factorising including GCSE style 6) Linking solving quadratics to the graph	Collecting like terms Multiplying with index notation Expanding and factorising Plotting quadratic graphs Solving equations	One written and one retrieval piece on expanding and factorising
Circle Theorems	Understand the properties of circles Calculate with a variety of circle theorems Develop an understanding of tangents	Radius, radii Tangent Chord Theorem Conjecture Derive Segment Chord Perpendicular	1) Develop understanding of properties of circles 2) Circle theorems 1 3) Circle theorems 2 4) Circle theorems 3 5) Circle theorems 4 6) Developing understanding of a mixture of the circle theorems 7) Combining circle theorems 8) Exam style circle theorems	Vocabulary of circles Angle facts, including angles at a point, on aa line and in a triangle Angle facts, involving parallel lines and vertically opposite angles Know the properties of special quadrilaterals Perpendicular lines	One written and one retrieval piece on circle theorems

YEAR 9 HALF TERM 3 MATHEMATICS SETS 1-2 LEARNING PROGRAMME

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Linear graphs	Plot graphs of the form y=-mx+c and ax+by=c Identify equations of lines from a graph Identify equations of lines from given coordinates Identify equations of parallel and perpendicular lines	Plot Equation Linear Coordinate (Positive/negative) gradient y-intercept Horizontal Vertical Parallel Perpendicular Substitute	1) Plotting all types of linear graphs 2) Rearranging the equation of a line 3) Exploring the gradient and finding the equation of a linear graph 4) Gradients from 2 coordinates 5) Equation of a line from the gradient and a point 6) Equation of a line from 2 points 7) Using technology to explore parallel and perpendicular lines 8) Equations of parallel lines 9) Equations of perpendiculars lines	Use coordinates in all four quadrants Write the equation of a line parallel to the x-axis or the y-axis Substitute positive and negative numbers into formulae Rearranging formulae	One written and one retrieval piece on linear graphs
Simultaneous equations	Solve two equations simultaneously, where no variable requires multiplication Solve two equations simultaneously, where variables require multiplication Solve simultaneous equations graphically	Simultaneous equation Variable Eliminate Intersect Coefficient	1) Solving simultaneous equations graphically 2) Solving basic simultaneous equations no multiplication by elimination 3) Solving basic simultaneous equations using substitution 4) Solving simultaneous equations – one multiplication 5) Solving simultaneous equations – multiplying both 6) A mixture of solving simultaneous equations 7) Worded simultaneous equations	Plot linear graphs Solve linear equations Substitute numbers into formulae Manipulate expressions by multiplying by a single term	One written and one retrieval piece on simultaneous equations

YEAR 9 HALF TERM 4 MATHEMATICS SETS 1-2 LEARNING PROGRAMME

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Venn and probability	Complete a two-circled Venn diagram Complete a three-circled Venn diagram	Set Venn diagram Union Intersection	1) Venn diagrams including multiples 2) Worded problem venn diagrams 3) Three circle venn diagrams 4) Consolidation lesson	Multiples, factors, primes Calculate the probability of mutually exclusive events Calculate the probability of non-mutually exclusive events	One written and one retrieval piece on venn diagrams
Algebraic fractions	Be able to simplify an algebraic fraction Be able to multiply and divide an algebraic fraction Be able to add and subtract an algebraic fraction	Equivalent Equation Expression Expand Linear Quadratic Difference of two squares Binomial Factorise	1) Factorising recap 2) Working with fractions 3) Simplifying algebraic fractions 4) Multiplying algebraic fractions 5) Dividing algebraic fractions 6) Multiplying and dividing algebraic fractions 7) Adding and subtracting with a numerical denominator 8) Adding and subtracting with an algebraic denominator	Simplify fractions by the division of factors Adding and subtracting proper fractions Multiplying and dividing proper fractions Factorising linear and quadratic expressions Change the subject of formulae	One written and one retrieval piece on algebraic fractions
Column vectors	Be able to draw a vector Add and subtract vectors Identify parallel vectors	Magnitude Direction Pythagoras Hypotenuse	1) Drawing a vector 2) Adding and subtracting 3) Multiplying vectors including Pythagoras 4) Parallel vectors	Identify parallel lines Translate shapes using vectors Arithmetic with negative numbers	One written and one retrieval piece on vectors.

YEAR 9 HALF TERM 5 MATHEMATICS SETS 1-2 LEARNING PROGRAMME

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Solving inequalities with graphs	Solve linear inequalities Draw inequalities of the form y=mx+c and ax+by=c Identify regions that satisfy inequalities of the form y=mx+c and ax+by=c	Inequality Coefficient Variable Region Solution set Parallel Intersection	1) Recap solving inequalities 2) Vertical and horizontal inequalities 3) Drawing inequalities involving y=mx+c and regions 4) Drawing inequalities written ax+by=c and regions 5) Drawing all types of linear graph and shading regions 6) Finding the inequality from a shaded region	Use set notation to list a set of integers Solve linear equations Substitute positive and negative numbers into formulae Plot graphs of linear functions	One written and one retrieval piece on inequalities.
Transformations	Translate shapes and describe a give translation Reflect shapes and describe a given reflection Rotate shapes and describe a given rotation Enlarge shapes with a positive and negative scale factor Describe a given enlargement	Origin Translation Reflection Rotation Transformation Object, Image Congruent Vector Similar Enlarge Scale factor Centre of enlargement	1) Translation – draw and describe 2) Reflections – draw and describe 3) Rotation and describing a rotation 4) Combining the 3 transformations 5) Positive and fractional enlargement 6) Negative enlargements 7) Describing enlargements 8) Combining all transformations	Work with coordinates in all four quadrants Carry out a translation using worded directions Identify equations of lines parallel to the axes Identify scale factors of similar shapes	One written and one retrieval piece on transformations

YEAR 9 HALF TERM 6 MATHEMATICS SETS 1-2 LEARNING PROGRAMME

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Solving quadratics, including from graphs	Solve quadratics using the Quadratic Formula Solve quadratics by completing the square Solve quadratics of the form $ax^2+bx+c=0$ by drawing a graph Solve a linear and quadratic equation simultaneously by drawing a graph	Factorise Linear Quadratic Gradient y-intercept Root	1) Recapping solving using factorising 2) Solving using the Quadratic Formula 3) Solving using completing the square 4) Plotting quadratic graphs =0 5) Plotting quadratic graphs using horizontal lines 6) Finding solutions graphically for a quadratic and linear graph	1. Resources\Academic texts, maths Solve linear equations Factorise a quadratic expression of the form $x^2 + bx + c$ Factorise a quadratic expression of the form $ax^2 + bx + c$ Substitution into algebraic formulae Simplifying surds Drawing quadratic graphs	One written and one retrieval piece on quadratics
Area and volume scale factor	Identify missing lengths in similar shapes Identify the area of a similar shape Identify the volume of a similar shape	Similar Area Volume Multiplier Scale factor Units	1) Recapping linear scale factor 2) Investigating and calculating with area SF 3) Investigating and calculating with volume SF 4) Exploring GCSE questions	Recognise similar shapes and their scale factors Converting between units Ratio and writing in the form 1:n	One written and one retrieval piece on scale factors
Constructions	Be able to bisect angles Be able to bisect a line Interpret and draw basic loci	Arc Line segment Perpendicular Bisect Perpendicular bisector Locus Loci	1) Bisecting angles 2) Bisect a line 3) Perpendicular to and from a line 4) Basic loci	Measure distances to the nearest millimetre Create and interpret scale diagrams Use compasses to draw circles	One written and one retrieval piece on constructions.