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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Number	Solve problems set in a real life context Using rounding to estimate calculations Identify different types of number Calculate fluently with all types of number in different contexts, including fractions, decimals and percentages Generate and use the nth term of sequences including quadratics	Power Roots Factor Rational Irrational	Solve problems set in a real life context Using rounding to estimate calculations Identify different types of number Calculate fluently with all types of number in different contexts, including fractions, decimals and percentages Generate and use the nth term of sequences including quadratics	A firm grasp of place value and the ability to order integers and decimals and use the four operations Knowledge of integer complements to 10 and to 100, multiplication facts to 10 x 10, strategies for multiplying large numbers Be able to recognise and recall squares, cubes and their associated roots and have knowledge of classifying integers	There will be a written piece of homework each week to asses learning. Videos and additional work can be accessed via www.corbettmaths.com Www.keshmaths.org.uk
Averages and graphs	Use and interpret Scatter diagrams Use averages to solve more complex problems Identify the advantages and disadvantages of each type of average Know which average to use in a given situation Calculate averages from grouped frequency tables	Continuous Qualitative Quantitative Correlation Population Sample frequency	Use and interpret Scatter diagrams Use averages to solve more complex problems Identify the advantages and disadvantages of each type of average Know which average to use in a given situation Calculate averages from grouped frequency tables	Read scales on graphs, draw circles, measure angles and plot coordinates in all four quadrants Fluent with tally charts and inequality notation Ability to find the midpoint of two numbers	There will be a written piece of homework each week to asses learning. Videos and additional work can be accessed via www.corbettmaths.com Www.keshmaths.org.uk

Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Number	Calculate fluently with ratio Recognise and solve problems using direct proportion Recognise and solve problems involving compound measures Calculate compound interest and repeated percentage change Calculate the original amount after a known percentage change	Recurring Reciprocal Integer Termination VAT Multiplier	Calculate fluently with ratio Recognise and solve problems using direct proportion Recognise and solve problems involving compound measures Calculate compound interest and repeated percentage change Calculate the original amount after a known percentage change	Know the four operations of number Be able to find common factors Have an understanding of fractions as being parts of a whole Define percentage as number of parts per hundred Awareness that percentages are used in everyday life	There will be a written piece of homework each week to asses learning. Videos and additional work can be accessed via www.corbettmaths.com Www.keshmaths.org.uk
Shape and transformations	Use geometric properties to calculate the size of angles in special quadrilaterals Calculate fluently with interior and exterior angles Draw and interpret diagrams using bearings and scale Demonstrate that two triangles are congruent using proof	Elevation Depression Quadrilateral Corresponding Alternate Co-interior	Use geometric properties to calculate the size of angles in special quadrilaterals Calculate fluently with interior and exterior angles Draw and interpret diagrams using bearings and scale Demonstrate that two triangles are congruent using proof	Recall basic angle facts Rearrange simple formulae and equations Understand that fractions are more accurate in calculations than rounded percentage or decimal equivalents	There will be a written piece of homework each week to asses learning. Videos and additional work can be accessed via www.corbettmaths.com Www.keshmaths.org.uk

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Polygons, Angles & Parallel Lines	To be able to understand and use the angle properties of parallel lines To be able to calculate and use the sums of the interior angles of polygons To be able to find the size of each exterior angle, or the number of sides of a regular polygon To be able to use angle facts to demonstrate how shapes would 'fit together',	Parallel Alternate Corresponding Co-interior Interior, exterior Polygon	Understand and use the angle properties of parallel lines (alternate and corresponding angles) Calculate and use the sums of the interior angles of polygons Use the sum of the exterior angles of any polygon is 360° Use the sum of the interior angles of an n-sided polygon Find the size of each interior angle, or the size of each exterior angle, or the number of sides of a regular polygon Use the side/angle properties of compound shapes to solve more complex problems and using algebra Use angle facts to demonstrate how shapes would 'fit together', and work out interior angles of shapes in a pattern	Use angles at a point, angles at a point on a line and vertically opposite angles to calculate missing angles in geometrical diagrams Know that the angles in a triangle total 180°	There will be a written piece of homework each week to reinforce key concepts.

Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Pythagoras & Trigonometry	To be able to justify if a triangle is right-angled using Pythagoras' theorem To be able to use the trigonometric ratios in order to find side lengths and angles of right-angled triangles To be know the exact trigonometric values	Pythagoras Surd Sine, cosine, tan Elevation, depression	Given three sides of a triangle, justify if it is right-angled or not Give an answer to the use of Pythagoras' Theorem in surd form Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D figures Find angles of elevation and depression Know the exact trigonometric values	Understand and work with similar shapes Solve linear equations, including those with the unknown in the denominator of a fraction Understand and use Pythagoras' theorem	There will be a written piece of homework each week to reinforce key concepts.
Linear Graphs	To be able to draw graphs of lines parallel to the axes To be able to Identify and interpret the gradient and y-intercept of a linear graph given by equations of the form $y = mx + c$	Gradient Y-intercept	Plot and draw graphs of lines parallel to axes, plus $y = x$ and $y = -x$ Identify and interpret the gradient of a line segment Identify and interpret the gradient and y-intercept of a linear graph given by equations of the form $y = mx + c$	Use coordinates in all four quadrants	There will be a written piece of homework each week to reinforce key concepts.

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Linear Graphs	To be able to find and draw an equation of a straight line from a graph in the form $y = mx + c$ To be able to find and draw an equation of a straight line from a graph in the form $ax + by = c$ To be able to find the equation of the line through one point with a given gradient To be able to identify gradients of parallel and perpendicular lines	Gradient Y-intercept Perpendicular Reciprocal	Find the equation of a straight line from a graph in the form $y = mx + c$ Plot and draw graphs of straight lines of the form $y = mx + c$ with and without a table of values Find the equation of the line through one point with a given gradient Find the equation of a straight line from a graph in the form $ax + by = c$ Plot and draw graphs of straight lines in the form $ax + by = c$ Find approximate solutions to a linear equation from a graph Find the equation of a line of best fit (scatter graphs) to model the relationship between quantities Explore the gradients of parallel lines and lines perpendicular to each other	Write the equation or draw the line parallel to the x-axis or the y-axis Substitute positive and negative numbers into formulae	There will be a written piece of homework each week to reinforce key concepts.

Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Graphs - Quadratic, Cubic etc	To be able to recognise a linear, quadratic, cubic, reciprocal and circle graphs To be able to plot and interpret simple quadratic functions To be able to draw cubic and reciprocal functions To be able to draw circles, centre the origin, equation $x^2 + y^2 = r^2$	Function Quadratic Cubic Reciprocal	Recognise a linear, quadratic, cubic, reciprocal and circle graph from its shape Generate points and plot graphs of simple quadratic functions Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function Interpret graphs of quadratic functions from real-life problems Draw graphs of simple cubic functions using tables of values Draw graphs of the reciprocal function $y = \dfrac{1}{x}$ with $x \neq 0$ using tables of values Draw circles, centre the origin, equation $x^2 + y^2 = r^2$ Solving where linear meets a circle	Write the equation or draw the line parallel to the x-axis or the y-axis Substitute positive and negative numbers into formulae Plot graphs of functions of the form $y = mx \pm c$ Plot graphs of functions of the form $ax \pm by = c$	

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Perimeter, Area & Circles	To be able to calculate the area of and perimeter compound shapes To be able to calculate perimeters and areas of composite shapes made from circles and parts of circles To be able to calculate arc lengths, angles and areas of sectors of circles	Circle Pi Radius Diameter Chord Circumference Arc Tangent Sector Segment Composite Metric	Calculate the area of and perimeter compound shapes made from triangles, rectangles, trapezia and parallelograms Calculate perimeters and areas of composite shapes made from circles and parts of circles Calculate arc lengths, angles and areas of sectors of circles Find radius or diameter, given area or circumference of circles in a variety of metric measures	Know and use the number π Know and use the formula for area and circumference of a circle	There will be a written piece of homework each week to reinforce key concepts.
Accuracy & Bounds	To be able to Calculate the upper and lowers bounds of numbers, using inequality notation To be able to find the upper and lower bounds of calculations involving perimeters, areas and volumes	Inequality Truncate Round Minimum Maximum Interval	Calculate the upper and lowers bounds of numbers given to varying degrees of accuracy Use inequality notation to specify an error bound Find the upper and lower bounds of calculations involving perimeters, areas and volumes of 2D and 3D shapes	Round to a given number of decimal places or significant figures Know the meaning of the symbols $<$, $>$, $\leq$, $\geq$	There will be a written piece of homework each week to reinforce key concepts.

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
3D Forms & Volume	To be able to find the volume of a cuboid or prism made from composite 3D solids To be able to find the surface area of cylinders, prisms, and pyramids To be able to convert between metric measures To be able to find the surface area and volumes of compound solids	Circle, Pi Radius Diameter Chord Circumference Arc Tangent Sector Segment (Right) prism, cylinder Cross-section Hypotenuse Pythagoras' theorem	Find the volume of a cuboid or prism made from composite 3D solids using a variety of metric measures Find the surface area of prisms Find the volume and surface area of a cylinder Find the volume and surface area of a pyramid Convert between metric measures of volume and capacity Find the surface area and volumes of compound solids constructed from cubes, cuboids, cones, pyramids, spheres, hemispheres, cylinders	Know and use the formula for area and circumference of a circle Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia Know how to find the area of compound shapes	There will be a written piece of homework each week to reinforce key concepts.

Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Graphs, the basics & real-Life	To be able to draw and interpret straight-line graphs for real-life situations To be able to draw distance–time and velocity–time graphs To be able to find the equation of the line through two given points	Extrapolate Interpolate Gradient	Draw and interpret straight-line graphs for real-life situations, including conversion graphs, fuel bills, fixed charge and cost per item Draw distance–time and velocity–time graphs Calculate the length of a line segment given the coordinates of the end points Find the equation of the line through two given points	Draw the lines y = x and y = -x Substitute positive and negative numbers into formulae	There will be a written piece of homework each week to reinforce key concepts.
Transformations	To be able to describe and enlarge shapes using a scale factor that is positive/ negative and integer/ fractional To be able to describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements	Scale Factor Similar Congruent Invariance Transformation Rotation Reflection Translation Enlargement	Describe and transform 2D shapes using enlargements by a positive integer, positive fractional, and negative scale factor, from a given centre Identify the scale factor of an enlargement of a shape Use congruence to show that translations, rotations and reflections preserve length and angle Describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements	Understand coordinates in all four quadrants Work out a multiplier given two numbers Understand the concept of an enlargement (no scale factor)	There will be a written piece of homework each week to reinforce key concepts.

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Quadratic & Simultaneous Equations	To be able to solve quadratic equations by factorisation, completing the square, and using the quadratic formula To be able to solve simultaneous equations in two unknowns (linear, quadratic or $x^2 + y^2 = r^2$)	Simultaneous Quadratic Linear Variable	Solve quadratic equations by factorisation and completing the square Solve quadratic equations by using the quadratic formula Solve two simultaneous equations in two unknowns (linear and linear) Solve two simultaneous equations in two unknowns (linear and quadratic) Solve two simultaneous equations in two unknowns (linear and $x^2 + y^2 = r^2$) Set up and solve a pair of simultaneous equations in two variables	Solve linear equations Substitute numbers into formulae Plot graphs of functions of the form y = mx + c, x ± y = c and ax ± by = c) Manipulate expressions by multiplying by a single term	There will be a written piece of homework each week to reinforce key concepts.
Probability	To be able to work out probabilities from Venn diagrams To be able to find a missing probability from a list or two-way table	Outcome, equally likely outcomes Event, independent event, dependent event Set	Work out probabilities from Venn diagrams Use union and intersection notation Find a missing probability from a list or two-way table, including algebraic terms	Know when to add two or more probabilities Know when to multiply two or more probabilities Convert between fractions, decimals and percentages	There will be a written piece of homework each week to reinforce key concepts.

YEAR 10	HALF TERM 5	MATHEMATICS SETS 1 - 2	LEARNING PROGRAMME

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Probability	To be able to draw a probability tree diagram for independent events To be able to draw a probability tree diagram and calculate conditional probabilities To be able to use a two-way table to calculate conditional probability	Outcome, equally likely outcomes Independent event, Dependent event Theoretical probability, Experimental probability Random Bias Unbiased Fair Conditional	Understand conditional probabilities and decide if two events are independent Draw a probability tree diagram for independent events Draw a probability tree diagram and calculate conditional probabilities Use a two-way table to calculate conditional probability Compare relative frequencies from samples of different sizes	Add fractions (decimals) Multiply fractions (decimals) Convert between fractions, decimals and percentages Use frequency trees to record outcomes of probability experiments Use experimental and theoretical probability to calculate expected outcomes	There will be a written piece of homework each week to reinforce key concepts.
Multiplicative Reasoning	To be able to solve proportion problems using the unitary method To be able to convert between speed measures and density measures	Multiplier Unitary Density Mass Volume	Express a multiplicative relationship between two quantities as a ratio or a fraction Solve proportion problems using the unitary method Convert between metric speed measures Convert between density measures	Understand the meaning of a compound unit Convert between units of length, capacity, mass and time	There will be a written piece of homework each week to reinforce key concepts.

Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Multiplicative Reasoning	To be able to identify the features of graphs that represent direct or inverse proportion To be able to solve problems involving direct and inverse proportion	Direct proportion Inverse proportion Multiplier Linear	Know the features of graphs that represent direct or inverse proportion Know the feature of expressions that represent a direct or inverse proportion situation Understand the connection between the multiplier, the expression and the graph Solve problems involving direct and inverse proportion	Find a relevant multiplier in a situation involving proportion Plot the graph of a linear function	There will be a written piece of homework each week to reinforce key concepts.
Similarity & Congruence	To be able to Understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles To be able to understand the implications of enlargement on area and volume	Congruent, Congruence Similar Similarity Hypotenuse Conjecture Derive Prove Proof Enlarge Scale factor	Understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles Understand the implications of enlargement on area and volume Move freely between scale factors for length, area and volume Solve practical problems involving length, area and volume in similar figures	Know angle facts including angles at a point, on a line and in a triangle Know angle facts involving parallel lines and vertically opposite angles Know Pythagoras' theorem Carry out an enlargement Find the scale factor of a given enlargement	There will be a written piece of homework each week to reinforce key concepts.

Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Trigonometric Graphs	To be able to recognise, sketch and interpret graphs of the trigonometric functions To be able to transform graphs	Exponential Function equation Linear / non-linear Quadratic Cubic Reciprocal Exponential Parabola Asymptote Maximum, Minimum Period Gradient, x & y-intercept root	Recognise, sketch and interpret graphs of the trigonometric functions (in degrees) Know the exact trigonometric values Apply to the graph of $y = f(x)$ the transformations $y = -f(x)$, $y = f(-x)$ for sine, cosine and tan functions f(x). Apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(x + a)$ for sine, cosine and tan functions f(x).	Recognise, plot and interpret exponential graphs Plot graphs of linear, quadratic, cubic and reciprocal functions Find sines, cosines and tangents of given angles	There will be a written piece of homework each week to reinforce key concepts.
Further Trigonometry	To be able to apply Area $= 1/2ab$ sin C to calculate the area, sides or angles of any triangle. To be able to apply the sine and cosine rules to solve 2D and 3D problems	Plane Opposite, Adjacent, Hypotenuse Trigonometry Sine, Cosine, Tangent Angle of elevation, angle of depression	Know and apply Area $= 1/2ab$ sin C to calculate the area, sides or angles of any triangle. Calculate the area of a segment Know the sine and cosine rules, and use to solve 2D and 3D problems Find the angle between a line and a plane	Apply Pythagoras' theorem in two dimensions Choose an appropriate trigonometric ratio that can be used in a given two-dimensional situation Set up and solve a trigonometric equation to find a missing side or angle in a right-angled triangle	There will be a written piece of homework each week to reinforce key concepts.

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Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Cumulative Frequency, Box Plots & Histograms	To be able to construct and interpret cumulative frequency tables and cumulative frequency graphs To be able to interpret box plots to find median, quartiles, range and interquartile range and draw conclusions To be able to construct and interpret histograms from class intervals with unequal width	Categorical data, Discrete data Continuous data, Grouped data Population Sample Cumulative frequency Box plot box-and-whisker diagram Central tendency Mean Median Mode Spread Dispersion consistency Range Interquartile range Skewness	Construct and interpret cumulative frequency tables and cumulative frequency graphs Compare the mean and range of two distributions, or median and interquartile range, as appropriate Interpret box plots to find median, quartiles, range and interquartile range and draw conclusions Construct and interpret histograms from class intervals with unequal width Estimate the mean and median from a histogram with unequal class widths	Know the meaning of discrete and continuous data Interpret and construct frequency tables Analyse data using measures of central tendency	There will be a written piece of homework each week to reinforce key concepts.