

	Good	Strong	High	Exceptional
<p>YEAR 11 HIGHER — AUTUMN 1 Advanced Trigonometry, Construction & Loci, Measures, Real-Life Graphs, Rates of Change, Area Under Curves</p>	<ul style="list-style-type: none"> Construct perpendicular bisectors, angle bisectors and loci with correct compass technique and identify loci regions Convert between common metric units Read values from graphs Calculate gradient using two points 	<ul style="list-style-type: none"> Interpret distance–time and speed–time graphs Estimate simple areas under linear graphs Convert between metric and compound units and calculate density and speed 	<ul style="list-style-type: none"> Apply the sine and cosine rules accurately to find unknown sides and angles Interpret non-linear graphs and find approximate intersections Calculate gradients and estimate tangents on curves Use the trapezium rule to estimate area under curves and interpret accumulation in real-world contexts Construct precise geometric constructions and loci, explaining why solutions satisfy distance and angle conditions Use compound units, bounds and limits of accuracy to solve real-world measurement problems involving uncertainty 	<ul style="list-style-type: none"> Select and apply the sine rule and cosine rule efficiently in multi-step non-right-angled triangle problems, including area calculations Solve complex trigonometry problems involving ambiguous case reasoning and justify method choice Interpret and sketch exponential and reciprocal graphs, identifying intersections and modelling behaviour Estimate instantaneous rate of change using tangents and explain the difference between average and instantaneous rates

What you need to know before this half term

- Use sin, cos and tan in right-angled triangles
- Apply Pythagoras' Theorem
- Rearrange formulae and use inverse operations
- Factorise and simplify algebraic expressions
- Use bounds and error intervals
- Calculate gradients of straight lines
- Read and interpret basic graphs
- Measure angles accurately and interpret geometric diagrams

Career links this half term

Mechanical Engineer

Uses trigonometry and graphs to model movement, forces and changing systems when designing machines and mechanical parts.

Environmental Scientist

Uses graphs, rates of change and data modelling to analyse pollution levels, climate data and environmental impact.

Tier 3 - Key Vocab

- Sine Rule** — A formula linking side lengths and opposite angles in any triangle
Cosine Rule — A formula that extends Pythagoras' Theorem to non-right-angled triangles
Ambiguous Case — A situation where two different triangles are possible using the sine rule
Perpendicular Bisector — A line that cuts another line exactly in half at 90°
Locus — A set of points that satisfy a given condition
Compass Construction — Creating exact geometric figures using a compass and ruler only
Upper Bound — The greatest possible value after rounding
Lower Bound — The smallest possible value after rounding
Compound Unit — A unit made from two measurements (for example km/h or g/cm³)
Density — Mass divided by volume
Exponential Graph — A graph showing rapid growth or decay using repeated multiplication
Reciprocal Graph — A graph where one variable is divided by another
Intersection — The point where two graphs cross
Gradient — The rate of change between two variables
Tangent — A straight line that touches a curve at one point
Instantaneous Rate of Change — The rate of change at a specific point on a curve
Trapezium Rule — A method for estimating area under a curve using trapezia

	Good	Strong	High	Exceptional
YEAR 11 HIGHER — AUTUMN 2 Further Graphs, Equations of Circles, 3D Representation, Volume, Congruency & Similarity	<ul style="list-style-type: none"> Solve linear equations Read key features from graphs Calculate volumes of cuboids Identify congruent shapes Interpret plans and elevations 	<ul style="list-style-type: none"> Factorise and solve quadratic equations Sketch and interpret quadratic graphs Use similarity to calculate missing lengths Calculate volume of prisms and cylinders Identify turning points and intercepts on graphs Apply congruence criteria (SSS, SAS, ASA, RHS) Calculate volumes of cones, spheres and composite solids 	<ul style="list-style-type: none"> Solve quadratic equations using multiple methods Use equations of circles and tangents Use completing the square and the quadratic formula to find turning points and exact solutions Sketch and interpret a wide range of function graphs (quadratic, cubic, reciprocal, exponential, trigonometric) Use scale factors to calculate length, area and volume relationships 	<ul style="list-style-type: none"> Solve linear and quadratic equations algebraically and graphically, interpreting roots and intersections Model geometric situations using the equation of a circle and find equations of tangents Apply congruence and similarity to justify geometric proofs Calculate volumes of complex solids and frustums, including exact values using π

What you need to know before this half term

- Expand and factorise algebraic expressions
- Solve linear and basic quadratic equations
- Interpret straight line and quadratic graphs
- Use coordinate geometry (gradient and intercepts)
- Apply angle facts and polygon rules
- Calculate areas of basic shapes
- Use scale factors and ratio
- Interpret simple 3D diagrams and nets

Tier 3 - Key Vocab

- Quadratic Formula** — A method used to solve any quadratic equation
- Turning Point** — The maximum or minimum point on a quadratic graph
- Tangent** — A straight line that touches a curve or circle at one point only
- Congruence** — When shapes are identical in size and shape
- Similarity** — When shapes have the same angles and proportional sides
- Frustum** — A solid formed when the top of a cone or pyramid is cut off

Career links this half term

Architect

Uses algebra, scale drawings and 3D geometry to design buildings and calculate volumes and space accurately.

Quantity Surveyor

Uses algebra, scale, area and volume to calculate building costs, materials and project budgets accurately.

	Good	Strong	High	Exceptional
YEAR 11 HIGHER — SPRING 1 Iteration, Collecting & Representing Data, Statistical Measures	<ul style="list-style-type: none"> Substitute values correctly into iterative formulas Read values from graphs and tables Calculate mean, median and range Interpret simple frequency tables Identify outliers from data sets 	<ul style="list-style-type: none"> Perform iteration with guidance and round appropriately Construct standard statistical diagrams (bar charts, box plots, time series) Use scatter graphs to describe correlation and make predictions Compare distributions using measures of central tendency and spread 	<ul style="list-style-type: none"> Apply iteration using recursive formulae and identify convergence Draw and interpret cumulative frequency graphs and histograms Calculate and interpret quartiles and interquartile range Compare data sets using both centre and spread, making justified inferences about populations Construct and interpret histograms with unequal class widths and cumulative frequency graphs to estimate quartiles Critically evaluate the validity of samples and data collection methods 	<ul style="list-style-type: none"> Set up and apply iterative processes from algebraic equations, identify convergence and justify stopping criteria

What you need to know before this half term
Solve linear and quadratic equations Substitute into algebraic expressions and functions Use rounding and decimal accuracy Calculate basic averages (mean, median, mode) Interpret simple graphs and frequency tables Sketch straight-line graphs Use volume and ratio knowledge for applied contexts

Tier 3 - Key Vocab
<p>Iteration — A numerical method that repeatedly applies a formula to find an approximate solution</p> <p>Convergence — When iterative values get closer to a final solution</p> <p>Recursive Formula — A formula that defines each term using the previous term</p> <p>Histogram — A graph showing frequency density for continuous grouped data</p> <p>Cumulative Frequency — A running total of frequencies used to find medians and quartiles</p> <p>Correlation — A relationship between two variables shown on a scatter graph</p> <p>Interpolation — Estimating values within the range of given data</p> <p>Extrapolation — Estimating values beyond the given data range</p> <p>Interquartile Range — The spread of the middle 50% of data</p> <p>Outlier — A value that is much larger or smaller than the rest of the data</p> <p>Population — The entire group being studied</p>

Career links this half term
<p>Data Scientist / Data Analyst Uses algebraic models and statistical tools to analyse large datasets and make decisions based on patterns and trends.</p> <p>Civil Engineer Uses algebra, modelling and geometry to design and plan infrastructure projects and ensure structural integrity.</p>

	Good	Strong	High	Exceptional
YEAR 11 HIGHER — SPRING 2 Transformations, Vectors, Functions & Probability	<ul style="list-style-type: none"> Identify and perform standard transformations on coordinate grids Use simple vector notation Substitute into functions Calculate probabilities from lists and tables Represent translations using column vectors Construct sample spaces 	<ul style="list-style-type: none"> Use function notation correctly Calculate probabilities of combined events Describe and apply transformations using column vectors and scale factors Add, subtract and multiply vectors by scalars Calculate probabilities using tree diagrams and two-way tables Solve conditional probability problems 	<ul style="list-style-type: none"> Find inverse and composite functions Apply and describe combined transformations, including negative and fractional scale factors, using correct mathematical notation Select and justify the most efficient probability model (tree diagram, two-way table, Venn diagram) 	<ul style="list-style-type: none"> Use vectors algebraically to justify geometric relationships and construct proofs Form, evaluate and reverse composite and inverse functions, explaining the effect on inputs and outputs Interpret and sketch function transformations, linking algebraic changes to graphical movement Solve complex probability problems involving conditional probability, dependent events and multiple representations

What you need to know before this half term	Tier 3 - Key Vocab
<ul style="list-style-type: none"> Plot coordinates and graphs accurately Use scale factor and ratio Rearrange formulae Understand basic function notation Use fractions, decimals and percentages List outcomes for simple probability experiments Use circle theorems and geometric reasoning 	<p>Invariance — A property that remains unchanged after a transformation</p> <p>Column Vector — A way of representing translation using vertical notation</p> <p>Scale Factor — The multiplier used to enlarge or reduce a shape</p> <p>Scalar — A number used to multiply a vector</p> <p>Resultant — The combined effect of two or more vectors</p> <p>Function Notation — A formal way to write functions using symbols such as $f(x)$</p> <p>Inverse Function — A function that reverses the effect of another function</p> <p>Composite Function — A function made by applying one function after another</p> <p>Conditional Probability — The probability of an event occurring given another event has already happened</p> <p>Mutually Exclusive — Events that cannot happen at the same time</p> <p>Sample Space — A list or diagram showing all possible outcomes</p>

Career links this half term
<p>Actuary Uses algebra, probability and modelling to assess financial risk and predict future outcomes for insurance and finance.</p> <p>Structural Engineer Uses geometry and algebra to analyse and design structures so that they safely withstand forces and loads.</p>