



THE  
**GARIBALDI**  
SCHOOL

# Garibaldi School Year 9 Overview Schemes of Learning 2023-2024 teaching



PRIDE • RESPECT • ACHIEVE

The Year 9 Scheme of Learning has been put together to ensure that our students build upon the mathematical knowledge they acquired at KS2 through to Years 7 & 8.

Throughout this Scheme we aim to provide an **enriched programme** of study that caters for all abilities and offers enough stretch and challenge so that pupils are fully equipped and prepared to start the GCSE Maths course at the start of Year 10

The Maths team have ensured that the order of learning is **progressive and logical**, and continues to develop deeper understanding and fluency, through reasoning, problem solving and **interleaving of content**. In addition, we aim to increase our students love and enthusiasm for maths and improve their understanding of the maths around them everyday.

There are lots of opportunities built into this scheme for pupils to see, work through, and attempt a range of practise questions taken from GCSE Maths papers, to ensure they are equipped in Years 10 & 11 with the right skill-set to answer a range of fluency, reasoning and problem-solving exam-style questions.

The maths team understands that **real-world maths** around **sustainability and the environment** are so important to the world in which we live and to our future generations, so we have also included in our ambitious curriculum the opportunity for students to gain a better understanding of how maths plays a crucial role in issues surrounding these two key drivers for change.

*Content shaded in purple in this SOL are higher tier content only.*



THE  
**GARIBALDI**  
SCHOOL

PRIDE • RESPECT • ACHIEVE

	Term 1			Term 2		
Autumn	Reasoning with Number			Reasoning with Number		Transformations
	Use of number systems	Fractional reasoning	Application of percentages	Application of numbers	Application of compound measures	Use of transformations
Spring	Algebra	Data		Angles	Surds	
	Algebraic manipulation	Displaying data		Working with angles	Calculating with surds	
Summer	Geometry		Equations	Probability	Graphs	
	Application of shape and space	Pythagoras and trigonometry	Simultaneous equations	Working with Probability	Interpret and use graphs	

# Year 9 Scheme of Learning 2023/24

## Reasoning With Number

## 1. Use of Number Systems

<u>Understanding Number Systems</u>	Be able to work with place value. Order and compare. Identify Inequality symbols & represent inequalities on number lines. Be able to add/subtract/multiply and divide integers and decimals. (Include Bank Statements)
<u>Rounding</u>	Be able to round to 10,100,1000. Be able to round to a given Decimal Place .
<u>Sig Figs</u>	Be able to round to various significant figures using integers and decimals.
<u>Estimation</u>	Estimate answers to calculations given a rule. Check answers to calculations by rounding. Estimate using 1 sig fig. apply to other topics such as area/perimeter/money.
<u>Error Intervals</u>	Write error intervals given an accuracy of rounding. Work with money.
<u>Upper and Lower Bounds</u>	Find Max and Min value for rounding. Find upper and lower bounds dependant on context. Involve compound measures.
<u>Recurring decimals</u>	Can identify if a fraction is a recurring decimal or not.
<u>Converting recurring Decimals</u>	Understand recurring notation & be able to write recurring decimals in fractions. Use algebra and be able to add and subtract recurring decimals and write in simplest form.
<u>Iteration</u>	Use iterative formulae to work out the next solutions to an equation.

## 2. Fractional Reasoning

<u>Fraction of an amount</u>	Find a fraction of an amount. Fractions of amounts where there is an improper fraction. Mixed numbers of an amount. Comparing fractions of amounts. Problems involving fractional increase/decrease.
<u>Fraction Operations</u>	Convert between mixed and improper fractions and understand terminology. Addition and subtraction of fractions with same denominator and different denominator. Multiply and Divide Fractions.
<u>Mixed Number Fraction Operations</u>	Be able to add/subtract/multiply and divide mixed numbers as calculations in context.
<u>Reverse Fractions</u>	Finding the original given the fraction. Finding a fraction given another fraction

## 3. Application of Percentages

<u>FDP</u>	Be able to work fluently with Decimals, Percentages and Fractions. Order FDP. Work out quantities using FDP.
<u>Percentages of amounts (Increase &amp; Decrease)</u>	Be able to represent percentages in diagrams. Find Fractions of amount using non calc & Calc methods. Percentage Inc/Dec by finding the amount and adding or subtracting.
<u>Percentage Change</u>	Be able to work out the quantity as a percentage of another. Be able to work out percentage change both increase and decrease given two quantities.
<u>Reverse Percentage</u>	Be able to find the whole given the final or given the part. Example:- Increase by 20%, new amount is 500. Find the original amount.
<u>Simple /Compound Interest</u>	Understand how to formulate the compound interest formula. Work out final values and interest gained. Reason with which option is best and also identify how many years an investment is needed to make a certain quantity.
<u>Depreciation</u>	Depreciation with compound percentage loss. Problems involving depreciation and compound interest by fractional amounts.
<u>More complex problems involving percentages.</u>	Application and extension of above

Real-world maths - Sustainability & the Environment lessons this half term:

1. Deforestation 2. Environmental impact of food

## Reasoning With Number

**4. Application of Number**

<u>Types of Number</u>	Be able to recognize multiples, factors, square and cube numbers, prime numbers, powers and roots. Fully understand terminology.
<u>Function Machines</u>	Be able to work out inputs and outputs of a functions machine. Work out missing operations given a function machine. Work with algebraic expressions as input or output of a function machine.
<u>Indices Rules</u>	Be able to understand what happens to indices when multiplying or dividing with common base. Simplifying algebraic and numerical base expressions with powers.
<u>Order of Operations</u>	Develop full understanding of the order of operations and not simply following BIDMAS. BIDMAS should be a recall tool not a rule to be learnt and followed.
<u>Product of Primes</u>	Be able to find the product of primes by using non-calculator and calculator methods. Be able to check a solution and justify if it is correct. Be able to work with product of primes to find factors and problem solve.
<u>HCF / LCM</u>	Understand the difference between HCF and LCM. Be able to find both HCF and LCM with and without finding product of primes and understand when it is most efficient to use a Venn to find solutions.
<u>Standard Form (Simplifying)</u>	Understand what standard form means and be able to check and correct answers. Be able to convert big and small numbers into standards form. Be able to write standard form solutions into written numbers. Ensure students can work with standard form both with and without a calculator.
<u>Standard Form Calculations</u>	Ensure students can multiply and divide standard form using indices rules but also finding the original then putting back into standard form. Students need to understand that they can work with original numbers to add and subtract but also when they can add standard form directly (e.g. when the powers are the same), and why that works.
<u>Fractional and Negative Indices</u>	Be able to work with negative integer powers. Understand how fractional indices effects the base. Work with negative and fractional indices. Be able to work fluently with indices and give answers in a given form.
<u>More complex Indices Problems</u>	Application and extension of above.

## Term 2 - Continued

## Reasoning with Number

## 5. Application of Compound Measures

<u>Ratio Recap</u>	Simplify ratio and split into a given ratio. Convert ratio to fraction and percentage. Work with ratio given a part. Work with ratio given a difference. Write in the form 1:n.
<u>Best Buy</u>	Find unit pricing. Compare best buy problems involving fractions and percentage discounts. Work out the best value to a given amount.
<u>Recipes</u>	Be able to find the proportion for 1. Be able to use non-calculator methods to build up to an amount. Use proportion to find any given amount needed to make a quantity. Find limiting factors to a given recipe.
<u>Limiting Factor Ratio</u>	Work with ratio to find factors that will limit a solution.
<u>Three Way Ratio</u>	Be able to combine two or more ratios into one. EXAMPLE - A:B = 3:4 and A:C = 2:3 Write in the form A:B:C Work with ratio problems involving two or more ratio quantities.
<u>Conversion Graphs</u>	Be able to plot quantities on a conversion graph. Identify values from a conversion graph. Extrapolate to find values not on a conversion graph. Make comparisons using a conversion graph.
<u>SDT / Distance Time Graph</u>	Understanding of speed units. Work with SDT fluently. Be able to identify movement and speed from a Distance time graph. Be able to calculate speed from a distance time graph.
<u>DMV</u>	Understand units of density. Fluently work with DMV in simple context. Work with DMV when the volume might need to be found from a shape. DMV problems when more than one material is compared and worked with.
<u>Before and After Ratio</u>	Working with ratio when a before after model is presented and to be able to understand what has changed in order to find values and solutions to problems.
<u>Direct and Indirect Proportion (Algebraic)</u>	Use of proportionality symbol. Understand the difference between direct and indirect. Be able to find the constant value and form equations involving proportionality. Use a given proportion equation to find unknowns. Be able to identify graphs of proportionality.
<u>Velocity Time Graphs</u>	Understand that velocity and speed are the same. Know the difference between distance-time graphs and velocity-time graphs. Understand how to find the acceleration from a velocity time graph and the units for acceleration. Find distance and determine if it is an underestimate or overestimate. Use total distance and total time to find the average speed (Velocity).

Real-world maths - Sustainability & the Environment lessons this half term:  
3. Petrol vs Hybrid vs Electric Cars 4. Solar Power/renewable energy

## Term 2 - Continued

## Transformations

**6. Use of Transformations**

<u>Translation</u>	Understand vector notation for movement. Be able to move a given shape using vector translations. Understand that to describe a translation we must use a vector. No invariance.
<u>Reflection</u>	Reflection across a given line (horizontal and vertical). Reflection given an equation of a line. Reflection across a diagonal mirror line. Understand that for a reflection you must be given a mirror line (or the equation of a line to reflect over).
<u>Rotation</u>	Rotations of a shape anywhere on a diagram. Understand rotations clockwise/anticlockwise and by $90^\circ$ , $180^\circ$ and $270^\circ$ . Understand that to be able to rotate a shape we need to know, how many degrees, clockwise/ anticlockwise and from where. Be able to rotate a shape given a point of rotation.
<u>Enlargement</u>	Understand that an enlargement can mean getting bigger or smaller. Enlarge shapes given a positive scale factor. Enlarge shapes given a fractional scale factor. Link the scale factor to where it is being mapped. Enlarge given a centre of enlargement. Understand information needed to enlarge: Scale factor, centre of enlargement. Link vector movements!
<u>Describing Transformations</u>	Be able to identify and describe all transformations. Important that if it states single transformation, that students know as soon as they mix one they score zero. Look at variance and comparing transformations using invariant points.
<u>Vector Resultants</u>	Simple vector resultants. Adding or subtracting any given vectors. Multiplying or dividing any given vectors. Writing a resultant to two or more vector movements. EXAMPLE : Given A and B ; Find $2A + 3B$ Draw simple vector resultants. Find a vector resultant given a geometric representation.
<u>Vector Geometry (Basic)</u>	Vector notations given a geometric representation. Be able to find and simplify vector resultants of geometric representations. Include ratio of lengths and scale factor quantities.
<u>Negative Enlargement</u>	Be able to work with negative enlargements. Use of vector translations to be able to work out the mapped movement. Students should be able to work with negative and fractional combined.
<u>Vector Geometry proving Parallel and Straight</u>	Be able to explain what a scalar multiple of a vector means. Understand how to prove if lines are parallel using scalar multiple. Be able to prove that a line is a straight line using vector scalar multiple.

## Algebra

## 7. Algebraic Manipulation

<u>Algebraic Manipulation</u>	Be able to form expressions. Use 4 operations with algebra. Form algebraic expressions given information. Begin working with inequalities.
<u>Expanding and Factorising Linear</u>	Expand single brackets. Expand and simplify expressions with single brackets. Factorise linear expressions. Interleave with perimeter, area etc.
<u>Solving Equations unknown on one side</u>	Be able to solve one step equations involving all operations. Be able to solve two step equations with unknown on either side. Be able to solve fractional equations involving one variable on one side. Ensure method is used to solve inequalities.
<u>Forming and Solving Equations</u>	Be able to form expressions and equations from both worded and geometric problems. Include angle problems, perimeter, area etc. Work with money in context. Change the subject for basic 1 and 2 step equations.
<u>Expanding</u>	Expand double brackets in the form $(x \pm a)(x \pm b)$ Also include with coefficient of x in the bracket.
<u>Substitution into Formula</u>	Substitution into a formula to be able to find any variable. EXAMPLE: Celsius to Fahrenheit conversion formula, cost formula, cooking time formula, medicine directions formula etc.
<u>Factorise Quadratics</u>	Be able to factorise quadratic into two brackets and also solve for when = 0. Understand that solutions are called the roots.
<u>Solving with unknown on both sides</u>	Solve algebraic equations involving unknown on both sides. Elimination of smallest unknown is preferred method. Ensure method is used for solving inequalities.
<u>Simplifying Algebraic Fractions</u>	Simplifying algebraic fractions with numerical denominators.
<u>Simplify Algebraic Fractions</u>	Simplifying fractions involving factorising of algebra. Simplifying fractions with algebraic denominators.
<u>Solving Algebraic Fractions (Linear)</u>	Solve Linear algebraic Fractions. Interleave with probability, SDT, DMV, Mean, Reverse Mean etc.
<u>Expanding Triple Brackets</u>	Expanding triple brackets in any form.

Real-world maths - Sustainability & the Environment lessons this half term:  
5. Littering, recycling & plastic ocean 6. Carbon Footprint



**8. Displaying Data**

<u>Discrete Representations</u>	Understand discrete representations of data including: Tally Charts. Pictograms. Bar Charts (single, dual and composite) Line graphs. Be fluent in drawing and interpreting.
<u>MMMR</u>	Basic understanding of the averages; Mean, Median and Mode. Understanding that range is a statistical measure but not an average. Evaluate which average is most appropriate. Be able to find missing values given the MMMR. Be able to work out new mean dependent on new data or changing data. Understand how changes affect the MMMR.
<u>Scatter Graphs</u>	Understand the difference between describing the relationship and stating the correlation. Know the three correlations and how to determine the strength of the correlation. Be able to plot values and identify outliers. Accurately draw and use a line of best fit for interpolation. Understand why extrapolation can not be used with a scatter graph.
<u>Mean from Table</u>	Calculate mean from discrete and continuous tables. Understand how to find the MMMR from discrete and continuous tables. Using midpoint to find an estimated mean. Be able to find missing frequencies given the mean/ estimated mean. Understand the impact when the group sizes are reduced.
<u>Pie Charts</u>	Understand pie charts are a representation of proportion. Finding scale factor and drawing pie charts when quantity is below and above 360. Interpreting pie charts given a part or difference using angle proportion. Comparing pie charts based on proportion not quantity.
<u>Comparing Statistics</u>	Be able to choose and explain which statistic gives you the best information given a set of data. (This changes depending on data given). Compare a set of MMMR and answer in context to the question.
<u>Cumulative Frequency</u>	Draw cumulative frequency diagrams and be able to interpret to answer questions based on quantity, proportion or percentage. Be able to argue or justify a given statement using a cumulative frequency curve.
<u>Box Plots / IQR</u>	Find IQR and draw box plots from a cumulative frequency curve or a set of data. Understand what percentage of the data is in the IQR and why it is good to use. (Middle 50% and removes outliers) Interpret box plots and be able to correct. Interpret and compare box plots using the median and IQR.
<u>Histograms</u>	Understand the reasoning for using a histogram. Be able to find the frequency density given data. Draw a histogram given a scale and without. Be able to find the scale from a histogram and information. Interpret histograms based on quantity, proportion and percentage.

Real-world maths - Sustainability & the Environment lessons this half term:  
7. Global warming 8. Home energy efficiency

## Angles and Number

## 9. Working with Angles

<u>Angle Properties</u>	Understand that an angle measures turn and isn't effected by line size. Know the different types of angles and descriptors. Identify angle type and write using angle notation.
<u>Angles around Point on a line</u>	Know that angles around a point add to $360^\circ$ . Be able calculate angles around a point.
<u>Angles in Triangles</u>	Know that angles in a triangle add to 180. Be able to work out interior and exterior angles of triangles with missing angles. Use triangles to prove that angles in a any quadrilateral add to 360. Use ratio, fraction of amount and algebra to find missing angle values.
<u>Parallel Lines</u>	Know the difference between two parallel lines and the transversal. Be confident that for a set of parallel lines and a transversal: all acute angles are equal and all obtuse angles are equal. Know the correct terminology and types of angles in parallel lines. Be able to use parallel line facts to find missing angles. Incorporate algebra into questions to solve.
<u>Exterior / Interior Angles in Polygons</u>	Be able to recall that exterior angles of polygons are given by $360 \div$ number of sides. $EXT + INT = 180$ . Sum of angles in a polygon given by $180(n-2)$ Use all the above facts to find missing values in regular polygon questions.
<u>Bearings</u>	Be able to identify bearing from a given point by knowing it must be 3 digits, from north and clockwise. Use parallel line rules to find missing bearings. Use bearings to draw on maps and find missing locations.
<u>Circle Theorems</u>	Start to explore and investigate circle theorems: 1) Isosceles triangle in a circle 2) Triangle in a semi-circle is a right-angled triangle. 3) Angle at the centre twice that of angle at circumference. 4) Cyclic quadrilateral in a circle.
<u>Geometric Proof</u>	Use geometric reasoning to prove angle size algebraically or prove a numerical value.

## 10. Surds (higher test only)

<u>Surds – introduction to the basics</u>	Be able to simplify surds.
<u>Surds – calculate with</u>	Can multiply, divide surds. Expand brackets and simplify surds. Add and subtract surds.
<u>Rationalise the denominator</u>	Can rationalise the denominator.
<u>Surds – more complex</u>	Extend to calculations involving areas of rectangles and triangles.

**11. Application of Space and Shape**

<u>Basic Perimeter, Area</u>	Be able to find perimeter and area of basic 2D shapes, including squares, rectangles, parallelograms, triangles, trapezium. Find missing lengths given the area. Work in real life context with area and perimeter. Calculate perimeter and area of compound shapes.
<u>Area and circumference of circles</u>	Be able to label and identify parts of a circle. Use formula to find the area and circumference of circles. Area of semi circles and quarters. Perimeter of semi circles and quarters. Be able to write answer in terms of $\pi$ . Find the radius/diameter given the area or circumference.
<u>Surface area and Volume</u>	Be able to find the surface area of basic 3D shapes. Be able to work with surface area in real life context. Find volume of cuboids and cubes. Find the volume of prisms. Work with volume in real life context. Find lengths given the surface area or volume.
<u>Arc and Sectors</u>	understand how to work with sectors to find area and arc lengths. Simple use of proportion of a full circle to be able to evaluate in terms of $\pi$ . Be able to work fluently to find the area/arc, radius/diameter.
<u>Cones, Sphere's and Pyramids</u>	Be able to work out the volume of cones, spheres and pyramids given the formula. Be able to work and simplify fully in terms of $\pi$ . Work with real life contexts.
<u>Surface Area more Complex</u>	Work with surface area in more complex scenarios. Interleave ratio, fraction of amount, percentage etc.
<u>Volume more Complex</u>	Working with volume in more complex scenarios. Use of time and rate of flow. Interleave ratio, fraction of amount, percentage etc.
<u>Frustums</u>	Use of scale factor to find missing lengths. Understand that a frustum is what is left from a cone. Be able to work in terms of $\pi$ . Work in real life context and use of rate of flow.

**12. Pythagoras and Trigonometry**

<u>Pythagoras</u>	Be able to determine if Pythagoras can be used. Find any missing length of a right angled triangle given the other two lengths. Extend to functional style questions.
<u>Trigonometry Lengths (basic)</u>	Accurately label a right angled triangle with H, A and O Develop a method of using trigonometry SOH CAH TOA to identify and evaluate the correct trigonometric ratio. Rearrange and apply the trigonometric ratio to find the given length.
<u>Trigonometry Angles (basic)</u>	Accurately label a right angled triangle with H, A and O Develop a method of using trigonometry SOH CAH TOA to identify and evaluate the correct trigonometric ratio. Rearrange and apply the trigonometric ratio to find the given angle.
<u>Trigonometry (functional)</u>	Calculate missing sides or angles in right-angled triangles using SOHCAHTOA in non-routine/functional style questions.
<u>Exact Values</u>	Know and recall exact trigonometric values for Sin, Cos and Tan for all the following: $0^\circ$ , $30^\circ$ , $45^\circ$ , $60^\circ$ and $90^\circ$ .
<u>Sine Rule</u>	Understand that Sine rule can be used on any triangle with a matching pair of angle and opposite side length. Be able to recall Sine rule and understand how to best use the formula based on finding an angle or length. Apply the formula to find lengths and angles. Apply in routine and non-routine questions.
<u>Cosine Rule</u>	Understand that Cosine rule can be used on any triangle with an angle sandwich (angle and two adjacent lengths). Be able to recall Cosine rule and understand how to best use the formula based on finding an angle or length. Apply the formula to find lengths and angles. Apply in routine and non-routine.
<u>Area Formula</u>	Use and apply Area formula for any triangle. $\frac{1}{2}ab\sin C$ Formula must be recalled by students. Be able to label accurately and use the area formula in routine and non-routine problems to find, area, as well as work backwards to find sides or angle.
<u>Exact trig values</u>	Extend to more complex calculations involving exact trig values and proofs.

Real-world maths - Sustainability & the Environment lessons this half term:

9. Rising sea levels    10. Climate & weather predictions

## Term 5

## Sequences

**13. Simultaneous Equations**Simultaneous Equations - Pictorial

Solve simultaneous equations using pictorial representations, where there are two unknowns but one of the equations has only one unknown. EXAMPLE 5 books and 13 rulers cost = £5.35  
9 rulers cost 90p. Work out the value of 7 books.

Simultaneous Equations - Elimination

Using elimination of a variable to solve simultaneous equations. Ensure a common number of a variable and understand when to add or subtract to eliminate.  
Extend where appropriate to changing one or both equations to make common variable.

Simultaneous Equations involving quadratics

Be able to solve simultaneous equations involving quadratics. Solving using linear/quadratic and quadratic and circles.

**14. Working with Probability**

<u>Probability of events</u>	Be able to write probabilities of events as fractions, decimals and percentages. Probability of basic events like rolling a dice or number problems.
<u>Probability adding to 1</u>	Understanding that probability adds to 1. Represent probabilities using fractions, decimals and percentages. Find missing values from probabilities presented in a table. Find probabilities of events given others EXAMPLE: $P(\text{win}) = 0.2$ $P(\text{Lose}) = 0.7$ find the $P(\text{draw})$ . Use probability notation.
<u>Sample Space Diagrams</u>	Be able to use a set of instructions to complete a sample space diagram. Interpret sample space diagrams given some parameters. Be able to scale the probability to any number of trials/frequencies to estimate probability.
<u>Combinations, Listing Outcomes</u>	Use listing strategies to find total number of combinations for a given problem. Write a probability given the listed outcomes. Find total number of outcome possibilities.
<u>Frequency Trees</u>	Be able to understand and use a frequency tree. Find missing numbers based on information given. Problems involving ratio and fraction of amount. Using algebra or ratio where two things are missing EXAMPLE: the number of boys is 3 times the number of girls. So $B:G = 3:1$ or $B = 3x$ and $G = x$ to solve. Using a frequency tree to work with a wider problem. Use frequency trees to state probabilities.
<u>Venn Diagrams</u>	Given information find missing areas of a Venn diagram. Be able to use a Venn diagram to find probabilities. Understand Set Notation.
<u>Tree Diagrams</u>	Using a tree diagram to represent outcomes of events. Be able to use decimals and fraction probabilities. Understand that each branch adds to 1. Work out probabilities by multiplying given outcomes. Work with independent and very basic dependent questions. Understand the difference between frequency and probability trees.
<u>Experimental Prob.</u>	Understand that the more trials the more accurate the probability. Use experimental probability to scale to find estimates.
<u>Relative Frequency</u>	Work out the relative frequency based off number of times the outcome has arisen over total trials. Use probabilities to find estimate outcomes for a set number of trials/attempts.
<u>Product Rule for Counting</u>	Understand and use the product rule for counting. Interpret information to be able to apply the product rule in various contexts. EXAMPLE: padlock codes, menu options, number problems etc. Be able to find probabilities of events using product rule.
<u>Conditional Probability</u>	Working with fractions and decimals to be able to work out probabilities that are conditional. The 1st outcome effects the 2nd probability etc.
<u>Probability with Algebra</u>	Be able to construct probabilities using algebra and hence solve to find accurate solutions using algebraic fractions.

**Graphs**

**End of Year Assessment**

**15. Interpret and Use Graphs**

<u>Drawing Linear graphs</u>	Be able to use a table of values to draw linear equations in all forms. E.g. $y = \pm ax \pm b$ and $\pm ax \pm by = \pm c$ Drawing linear graphs by finding 3 points. Evaluating if a given point is on a line.
<u>Y=Mx+C</u>	Given an equation of the form $y = mx+c$ be able to identify the gradient and y-intercept. Given an equation not in the form $y = mx+c$ , be able to rearrange and find the gradient and y-intercept. Given a line, be able to write the equation in the form $y = mx+c$ and state the gradient and y-intercept. Extend where appropriate to find the equation of a line given two points.
<u>Drawing Quadratic / Cubic graphs</u>	Be able to draw quadratic/cubic graphs given a table of values both non-calculator and calculator. Recognize cubic and quadratic graph characteristics.
<u>Roots and Turning Points</u>	Understand and be able to identify the roots and turning points of a quadratic graph. Be able to use the graph to determine values for specific solutions. EXAMPLE: Find solutions for when $x^2 + 3x + 1 = 3$ Draw a line at $y = 3$ and see where it intersect the curve; state the x coordinate.
<u>Parallel Lines</u>	Be able to identify parallel lines based off the gradient. Parallel = SAME gradient. Be able to evaluate and find lines that are parallel to others.
<u>Perpendicular Lines</u>	Be able to identify perpendicular lines based off the gradient. Perpendicular = NEGATIVE RECIPROCAL gradient Be able to evaluate and find lines that are perpendicular to others.
<u>Equation of Tangent to Circle</u>	Use knowledge of equation of circle, circle theorems (tangent meets radius at 90 degrees hence perpendicular) and gradient to find the equation of tangents to circles in the form $y=mx+c$ . Use the equation of the line to find intersection points on the x and y axis.
<u>Graphical Inequalities</u>	Be able to draw straight lines with inequalities. Understand how to represent the different inequality symbols. E.g. bold for 'and equal to' $\leq$ and $\geq$ , dashed for $>$ and $<$ 'not equal to'. Plot and recognize the acceptable region available and clearly show to the examiner.
<u>Graph Transformations</u>	Familiarise students with the changes that occur for graph transformations, following a translation or a reflection (only). Be able to determine how a graph changes based of the transformation and also be able to determine the changed equation if given a transformation.

**Revise/Assess/Improve**  
**using Red Assessment**  
**books/RAG docs**