

YEAR 9

EMERGING

SECURING

DEEPENING

MASTERING

Algebraic Manipulation

Fluency

- Simplify expressions by collecting like terms
- Solve simple equations and check the solution is correct
- Solve picture simultaneous equations
- Find HCF of integers
- Factorise simple expressions

- Solve 2 step equations using inverse operations
- Solve equations involving brackets
- Solve equations involving fractions
- Substitute into formulae and solve equations
- Solve simultaneous equations when coefficient are positive and the same
- Solve simultaneous equations when coefficients are the same but one is negative
- Find HCF of linear algebraic expression including indices
- Expand single brackets
- Expand double brackets where $a = 1$
- Factorise simple quadratic expressions all positive values

- Solve equations with unknowns on both sides
- Solve simultaneous equations when you change one of the equations
- Expand double brackets and collect like terms including when $x > 1$
- Factorise more complex quadratic expression including negatives

- Solve linear equation involving reciprocals
- Solve all simultaneous equations
- Derive and solve simultaneous equations in context
- Recognise the DOTS and factorise expression that contain DOTS
- Explore factorising quadratics where $a > 1$

Revision

Reflect on how well you prepared for this assessment:

Fluency score: /20

Target

Identify an area that you would like to improve on in future:

This target is: Met
 Ongoing

Angles and Geometric Properties	Fluency	<input type="checkbox"/> Know and apply angles on a straight line <input type="checkbox"/> Know and apply angles in a triangle <input type="checkbox"/> Know and apply vertically opposite angles <input type="checkbox"/> Know and apply angles around a point <input type="checkbox"/> Recognise parallel lines	<input type="checkbox"/> Know and apply alternate angle rule <input type="checkbox"/> Know and apply corresponding angle rule <input type="checkbox"/> Know and apply co-interior angle rule <input type="checkbox"/> Recognise and name polygons with n sides <input type="checkbox"/> Recognise that interior and exterior angles sum to 1 <input type="checkbox"/> Know and use exterior angles of any polygon sums to 1	<input type="checkbox"/> Work with a range of parallel line facts to solve problems <input type="checkbox"/> Know and use internal angle of polygons rule <input type="checkbox"/> Draw diagrams to scale <input type="checkbox"/> Use scales in amps and plans <input type="checkbox"/> Calculate bearings	<input type="checkbox"/> Work interchangeably with internal and external angles of polygons <input type="checkbox"/> Solve geometric problems and show reasoning <input type="checkbox"/> Calculate bearing from worded problems	
	Revision	Reflect on how well you prepared for this assessment:				Fluency score: /20
	Target	Identify an area that you would like to improve on in future:				This target is: <input type="checkbox"/> Met <input type="checkbox"/> Ongoing

Further Averages	Fluency	<input type="checkbox"/> Find the mode median and range from a small set of integer data values <input type="checkbox"/> Complete a tally chart from a set of data values <input type="checkbox"/> Find the mode from ungrouped frequency table <input type="checkbox"/> Find the range of ungrouped frequency table <input type="checkbox"/> Find the mode from a grouped frequency table	<input type="checkbox"/> Find the mode, median, mean and range from data values <input type="checkbox"/> Complete an ungrouped frequency table from a set of values <input type="checkbox"/> Complete a grouped frequency table from a set of values <input type="checkbox"/> Find the mode, median, mean and range from small, ungrouped frequency table	<input type="checkbox"/> Understand how to calculate the position of the median value <input type="checkbox"/> Calculate cumulative frequency <input type="checkbox"/> Find the median value from the position in ungrouped frequency table <input type="checkbox"/> Find the median value in grouped frequency table using its position <input type="checkbox"/> Calculate the mean from a grouped frequency table <input type="checkbox"/> Know that the range is a measure of spread	<input type="checkbox"/> Apply finding the mean, mode, median and range to all frequency table <input type="checkbox"/> Compare data using an average and its spread	
	Revision	Reflect on how well you prepared for this assessment:				Fluency score: /20
	Target	Identify an area that you would like to improve on in future:				This target is: <input type="checkbox"/> Met <input type="checkbox"/> Ongoing

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Length, Area and Volume

Fluency

- Identify radius, diameter and circumference of a circle
- Understand the diameter is twice the size of the radius
- Calculate the circumference of a circle using a calculator
- Know the difference between prisms and pyramids
- Count faces, edges and vertices
- Match a 3D shape to its net

- Identify chord, arc tangent of a circle
- Identify sectors and segments
- Calculate the circumference and area of a circle
- Estimate calculations involving pi
- Calculate arc length of semi circles and quarter circles
- Calculate sector area of semi circles and quarter circles
- Recognise and name 3D shapes
- Calculate the volume of prisms
- Draw nets of 3d shapes
- Calculate the surface area of cubes and cuboids

- Find the radius / diameter of a circle when given the circumference
- Find the radius / diameter of a circle when given the area
- Calculate the length of the arc
- Find the perimeter of a sector
- Calculate the area of a sector
- Solve problems working between area and circumference of circles
- Calculate volume of all prisms including cylinders
- Calculate the surface area of all prisms
- Draw correct plans and elevations

- Calculate the radius / diameter of a sector given arc length
- Calculate the radius / diameter of sector given sector area
- Solve complex geometric problems involving circles
- Solve complex problems by working interchangeably between surface area and volume
- Work backward to find missing lengths given volume or surface area
- Solve problems involving density

Revision

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Fluency score: /20

Target

Identify an area that you would like to improve on in future:

This target is: Met
 Ongoing

Index Laws and Standard Form	Fluency	<ul style="list-style-type: none"> <input type="checkbox"/> Know and use the multiplication and division laws of indices on simple terms <input type="checkbox"/> Know and use the power index law for simple terms <input type="checkbox"/> Convert large and small numbers between standard form and ordinary form <input type="checkbox"/> Identifying numbers in standard form 	<ul style="list-style-type: none"> <input type="checkbox"/> Know and use the multiplication and division laws of indices for numbers and algebraic terms <input type="checkbox"/> Know and use the power index law for numbers and algebraic <input type="checkbox"/> Apply combinations of index laws <input type="checkbox"/> Know the effect of a negative index and evaluate simple terms with negative indices <input type="checkbox"/> Convert large and small numbers between standard form and ordinary form <input type="checkbox"/> Identifying numbers in standard form 	<ul style="list-style-type: none"> <input type="checkbox"/> Apply combinations of the multiplication, division and power index laws to more complicated numerical or algebraic terms <input type="checkbox"/> Know the effect of a negative index and evaluate or simplify terms with negative indices <input type="checkbox"/> Convert large and small numbers between standard form and ordinary form <input type="checkbox"/> Calculate with numbers in standard form <input type="checkbox"/> Solve problems with standard form 	<ul style="list-style-type: none"> <input type="checkbox"/> Apply combinations of the multiplication, division and power index laws to more complicated numerical or algebraic terms <input type="checkbox"/> Know the effect of a negative index and evaluate or simplify more complex terms with negative indices <input type="checkbox"/> Convert large and small numbers between standard form and ordinary form <input type="checkbox"/> Solve worded and calculation problems with numbers in standard form <input type="checkbox"/> Convert recurring decimals into fractions using an algebraic method 	
	Revision	Reflect on how well you prepared for this assessment:				Fluency score: /20
	Target	Identify an area that you would like to improve on in future:				This target is: <input type="checkbox"/> Met <input type="checkbox"/> Ongoing

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Equations of Linear Graphs

Fluency

- Use a coordinate grid and be able to plot points
- Draw vertical and horizontal lines from their equation
- Complete a table of x and y values for simple linear functions
- Plot linear graphs from a table of values
- Recognise and plot simple quadratic graphs

- Solve geometrical problems on a coordinate grid
- Understand the properties and equations of horizontal and vertical lines
- Complete a table of x and y values for simple linear functions
- Plot linear graphs from a table of values
- Plot simple quadratic graphs and begin to identify its features.

- Understand the relationship between the equation of a line and its graph
- Identify the gradient and y-intercept of a line from its equation
- Draw linear graphs where the equation is given implicitly.
- Find the equation of a line from its graph (equal aspect axes)
- Interpret gradient and y-intercept in a simple contexts
- Plot quadratic graphs and know their key features.

- Explain the relationship between the equation of a line and its graph
- Draw linear graphs using their properties (interpreting the equation)
- Know multiple methods for plotting linear graphs where the equation is given implicitly.
- Find the equation of a line from its graph (unequal aspect axes)
- Interpret gradient and y-intercept in a range of contexts
- Understand that the point of intersection of two graphs represents the solution to the simultaneous equations

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Transformations

Fluency

- Perform and describe a translation on a coordinate grid
- Perform and describe a rotation on a coordinate grid
- Perform and describe a reflection on a coordinate grid
- Enlarge shapes given a positive integer scale factor

- Perform and describe a translation on a coordinate grid using vector notation
- Perform and describe a rotation on a coordinate grid
- Perform and describe a reflection on a coordinate grid using algebra to define the mirror line
- Enlarge shapes given a positive integer scale factor and a centre of enlargement
- Know the definitions of congruent and similar

- Perform combinations of transformations on a coordinate grid
- Identify an invariant point in a given transformation/combination of transformations.
- Enlarge shapes given fractional scale factors and a centre of enlargement
- Describe enlargements performed on a coordinate grid
- Understand the criteria by which triangles are congruent
- Use similarity to find missing lengths in two shapes side by side

- Identify when combinations of transformations are equivalent
- Generalise facts about invariant point for each type of transformation
- Enlarge shapes given negative scale factors and a centre of enlargement
- Use the criteria for congruence in geometrical proofs
- Use similarity to find missing lengths in more complicated contexts (e.g. triangles within other shapes)

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Trigonometry	Fluency	<input type="checkbox"/> Label the sides of a right-angled triangle and know which trig ratio to use for the question <input type="checkbox"/> Be able to use the inverse trig functions on a calculator <input type="checkbox"/> State some of the exact trig values	<input type="checkbox"/> Rearrange the trig equation appropriately to find an unknown side length in a right-angled triangle <input type="checkbox"/> Use the inverse trig functions to find an unknown angle in a right-angled triangle <input type="checkbox"/> State all of the exact trig values given the exact values triangles	<input type="checkbox"/> Find an unknown side in a right-angled triangle within a compound shape <input type="checkbox"/> Find an unknown angle when it is described as an angle of elevation or angle of depression <input type="checkbox"/> Draw the exact values triangles and state all the trig values from them	<input type="checkbox"/> Find an unknown length in a right-angled triangle from a worded scenario (i.e. requiring me to create the appropriate diagram) <input type="checkbox"/> Use trigonometry to find bearings in a problem <input type="checkbox"/> Solve trig problems using exact values (i.e. without a calculator)	
	Revision	Reflect on how well you prepared for this assessment:				Fluency score: /20
	Target	Identify an area that you would like to improve on in future:				This target is: <input type="checkbox"/> Met <input type="checkbox"/> Ongoing

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Reasoning	Describe and explain	I can... <input type="checkbox"/> Describe some of the stages in a method	I can... <input type="checkbox"/> Describe a complete mathematical method <input type="checkbox"/> Explain some of the steps in a method (i.e. why do you perform a particular step?)	I can... <input type="checkbox"/> Describe a complete method using correct mathematical vocabulary	I can... <input type="checkbox"/> Use correct mathematical vocabulary to explain why a particular method works
	Understand mistakes	I can... <input type="checkbox"/> Identify and correct mistakes in a worked solution	I can... <input type="checkbox"/> Explain how I know an answer in a worked solution is incorrect	I can... <input type="checkbox"/> Identify the misconception behind an incorrect answer (i.e. explain why the mistake was made)	I can... <input type="checkbox"/> Create a worked example that demonstrates a common misconception
Problem Solving	Vocabulary & notation	I can... <input type="checkbox"/> Highlight some key words and mathematical facts	I can... <input type="checkbox"/> Highlight all the necessary key words and mathematical facts	I can... <input type="checkbox"/> Find connections between the highlighted information	I can... <input type="checkbox"/> Interpret key mathematical terms correctly to find the right connection.
	Diagrams	I can... <input type="checkbox"/> Label a given diagram or representation with at least one piece of relevant information	I can... <input type="checkbox"/> Draw a useful diagram/representation to help me with the problem	I can... <input type="checkbox"/> Make use of my diagram/representation to solve a problem	I can... <input type="checkbox"/> Use diagrams or representations to simplify more complex problems
	Written communication	I show in my workings... <input type="checkbox"/> A visible correct first step to solving the problem	I show in my workings... <input type="checkbox"/> More than one correct logical step to solve the problem	I use... <input type="checkbox"/> A logical order in my workings, which make it easy for the reader to follow my solution	I use... <input type="checkbox"/> Correct mathematical notation throughout
	Devise a plan	I can... <input type="checkbox"/> Identify the area of maths required to solve the problem	I can... <input type="checkbox"/> Identify all the areas of maths required to solve a problem	I can... <input type="checkbox"/> Devise a plan that shows progression through a problem	I can... <input type="checkbox"/> Devise the most efficient plan or refine a plan as I go
	Check and reflect	I have... <input type="checkbox"/> Checked I haven't made a silly mistake	I look... <input type="checkbox"/> For errors and can correct them	I can... <input type="checkbox"/> Check that the size of my answer makes mathematical sense	I can... <input type="checkbox"/> Produce and evaluate multiple methods for solving a problem
	Independence	I need... <input type="checkbox"/> Help to get started	I can... <input type="checkbox"/> Get started by myself	I can... <input type="checkbox"/> Get most of the way through a complex problem unaided	I can... <input type="checkbox"/> Complete a complex problem unaided