Mathematics Higher

REVISION LIST – YEAR 11 MOCK EXAMS

For your Year 11 mock exams, you will be completing the following exams in our subject:

Paper	Time	Marks Available
Paper 1 – Non Calculator	1 hr 30 minutes	80
Paper 2 – Calculator	1 hr 30 minutes	80
Pape 3 - Calculator	1 hr 30 minutes	80

To s

Unit		Unit / Topic	Complete
1	a	**Calculations, checking and rounding**	
		Four operations with decimals and whole numbers	
		Use one calculation to find the answer to another	
		Product rule	
		Rounding & estimation	
	b	**Indices, roots, reciprocals and hierarchy of operations**	
		Use index notation including fractional and negative powers	
		Order of operations	
	c	**Factors, multiples and primes**	
		Identify factors, multiples and prime numbers	
		Find prime factorisation of a number (& write in index form)	
		Find common factors & highest common factors	
		Find LCM of two (or three) numbers	
	d	**Standard form and surds**	
		Index laws to simplify & calculate the value of an expression	
		Convert between ordinary numbers and standard form	
		Work with the four operations in standard form	
		Use a calculator with indices and standard form	
		Simplify surd expressions	
2	a	**Algebra: the basics**	
		Write an expression	
		Collect like terms	
		Simplify expressions	
		Use index laws	
		Expand single & double brackets	
		Factorise single brackets	
		Factorise quadratic expressions	
		Factorise quadratic expressions using difference of two squares	
	b	**Setting up, rearranging and solving equations**	
		Set up expressions and equations	
		Substitute into expressions, equations and formulae	
		Solve linear equations and inequalities	
		Change the subject of a formula	
		Iteration	
	c	**Sequences**	
		Continue sequences inc from pictures	
		Find the nth term	
		Use nth term rule to generate or continue a sequence	
		Find the nth term of a quadratic sequence	
		Distinguish between arithmetic and geometric sequences	
		Recognise and use simple geometric progressions	
		Find term to term rule of a geometric sequence, including negative, fraction and decimal terms	
3	a	**Averages and range**	
		Use various charts & diagrams in relation to averages	
		Two way tables	
		Calculate the mean, mode, median and range from a list	
		Median, mean and range from a table (discrete data)	
		Modal class, median and estimate of the mean from grouped data	
		Draw and interpret stem and leaf diagrams	
	b	**Representing and interpreting data**	
		Know which chart or diagram to use for different data sets	
		Draw and interpret bar charts (inc dual & composite)	
		Draw and interpret line graphs (vertical & time-series)	
		Draw and use pie charts	
		Find mode & total frequency from a pie chart	
		Compare two pie charts	
		Produce and interpret histograms	
		Compare distributions	
	c	**Scatter graphs**	
		Draw and use scatter graphs & lines of best fit	
		Identify outliers & correlation	

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4	a	**Fractions**	
		Equivalent fractions including simplifying & comparing	
		Express one amount as a fraction of another	
		Convert between mixed numbers and improper fractions	
		Four operations using fractions	
		Find a fraction of an amount	
		Convert between recurring decimals to fractions and vice versa	
	b	**Percentages**	
		Use fraction to decimal conversions	
		Recognise terminating & recurring decimals	
		Convert between fractions, decimals & percentages	
		Order & compare fractions, decimals & percentages	
		Write one amount as a percentage of another	
		Calculate percentage of an amount	
		Calculate percentage increase/decrease	
		Use decimals to find quantities (multiplier methods)	
		Increase / decrease an amount by a percentage	
		Reverse percentages	
	c	**Ratio and proportion**	
		Write ratios in their simplest form (including in context)	
		Share a quantity in a given ratio (including 3-part ratios)	
		Use a ratio to find one quantity when another is known	
		Compare ratios	
		Write ratio in the form 1:n or n:1	
		Write a ratio as a fraction and vice versa	
		Write a ratio as a linear function	
		Use direct & inverse proportion (and recognise graphically)	
		Recipes	
		Currency conversions	
5	a	**Polygons, angles and parallel lines**	
		Measure and draw lines, angles, 2D & 3D shapes	
		Identify and name 2D shapes and their properties	
		Identify parallel and perpendicular lines	
		Use angle facts - around a point, straight line, vertically opposite etc	
		Use angle properties of parallel lines	
		Use sum of interior angles for irregular & regular polygons	
		Use sum of exterior angles for regular polygons	
		Use the side/angle properties of compound shapes made up of triangles, lines and quadrilaterals	
	b	**Pythagoras' Theorem and trigonometry**	
		Pythagoras' Theorem	
		Trigonometry - sin, cos and tan	
		Know exact trig values	
6	a	**Graphs: the basics and real-life graphs**	
		Use coordinates in all four quadrants	
		Conversion graphs	
		Fixed cost and cost per unit graphs	
		Distance / time and Velocity/ time graphs	
		Midpoints of a line segment	
		Calculate the length of a line segment	
	b	**Linear graphs and coordinate geometry**	
		Draw, use and interpret (inc gradient) straight line graphs	
		Find the equation of a line through two points	
		Find the equation of a line (including from a graph)	
		Identify parallel and perpendicular lines	
		Generate equations of parallel and perpendicular lines	
	c	**Quadratic, cubic and other graphs**	
		Plot quadratic graphs	
		Find solutions, intercepts & turning points of a quadratic graph	
		Recognise and sketch cubic functions	
		Recognise and sketch reciprocal functions	
		Draw circles, centre the origin, equation $x^2 + y^2 = r^2$.	

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7	a	**Perimeter, area and circles**	
		Convert between metric measures	
		Read scales	
		Perimeter of 2D shapes	
		Area of 2 D shapes and compound shapes	
		Name parts of a circle	
		Recall & use formula for area and circumference of a circle	
		Arcs and sectors	
	b	**3D forms and volume, cylinders, cones and spheres**	
		Identify and name 3D forms and their properties	
		Volume of a cuboid	
		Volume of a prism	
		Volume of a composite forms	
		Surface area of prisms & simple compound forms	
		Surface area & volume of a cylinder	
		Spheres, pyramids, cones, frustums and composite solids.	
	c	**Accuracy and bounds**	
		Calculate the upper & lower bounds of numbers	
		Calculate the upper & lower bounds of an expression	
		Use error intervals (inc truncation)	
8	a	**Transformations**	
		Transform and describe translations, rotations & reflections	
		Transform and describe enlargements inc fractional and negative SF	
		Transform shapes using a combination of transformations	
		Describe transformations when using multiple transformations	
		Describe the changes & invariance achieved by combinations of transformations	
	b	**Constructions, loci and bearings**	
		Draw plans and elevations of shapes	
		Draw a 3D form given its plan and elevations	
		Use maps, scale drawings & bearings	
		Standard constructions	
		Find regions satisfying a combination of loci	
		Find and describe regions satisfying a combination of loci, including in 3D	
		Use constructions to solve loci problems including with bearings	
9	a	**Solving quadratic and simultaneous equations**	
		Set up and solve quadratic equations	
		Completing the square	
		Quadratic Formula	
		Solve simultaneous equations algebraically and graphically (linear/linear)	
		Solve simultaneous equations algebraically and graphically (linear/quadratic)	
		Solve simultaneous equations algebraically and graphically (linear/circle)	
	b	**Inequalities**	
		On a number line	
		Listing numbers that satisfy an inequality	
		Solving inequalities and show the solution on a number line	
		Represent and interpret inequalities graphically	
10		**Probability**	
		Probability scale	
		Listing outcomes	
		Two-way tables	
		Frequency trees	
		Use 1-p	
		Relative frequency	
		Sample space diagrams	
		Venn diagrams & set notation	
		Probability tree diagrams	
11		**Multiplicative reasoning**	
		Best value	
		Use compound measures Pressure, Density & Speed	
		Percentage profit / loss	
		Reverse percentages	
		Simple interest	
		Compound interest & growth	
		Depreciation & decay	
		Rates of pay	

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12		**Similarity and congruence in 2D and 3D**	
		Use congruence criteria for triangles (SSS, SAS, ASA and RHS):	
		Use formal geometric proof involving similarity & congruence	
		Identify similar shapes	
		Identify scale factors and find missing lengths in similar shapes	
		Use length, area and volume scale factors	
		Area and surface area of frustums	
13	a	**Graphs of trigonometric functions**	
		Recognise, sketch and interpret graphs of the trigonometric functions	
		Exact trig values	
		Transforming graphical functions	
	b	**Further trigonometry**	
		Formula for area of a triangle	
		Sine rule in 2D and 3D	
		Cosine rule in 2D and 3D	
		Pythagoras Theorem in 3D	
14	a	**Collecting data**	
		Types of data	
		Bias and eliminating bias	
	b	**Cumulative frequency, box plots and histograms**	
		Construct & interpret cumulative frequency tables/graphs	
		Median, quartiles & interquartile range from cumulative diagrams	
		Construct & interpret box plots	
		Median, quartiles & interquartile range from box plots	
		Construct & histograms	
		Estimate the mean and median from a histogram	
15		**Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics**	
		Sketch quadratics	
		Identify roots, turning points and intercepts of quadratic graphs	
		Completing the square	
		Expand the product of more than two linear expressions	
		Sketch cubics	
		Solve simultaneous equations graphically	
		Solve and represent quadratic inequalities	
16	a	**Circle theorems**	
		Parts of a circle	
		Prove, recall and apply circle theorems	
	b	**Circle geometry**	
		Recognise and construct the graph of a circle	
		Find the equation of a tangent to a circle	
17		**Changing the subject of formulae (more complex), algebraic fractions, solving equations arising from algebraic fractions, rationalising surds, proof**	
		Rationalise the denominator involving surds	
		Simplify, multiply and divide algebraic fractions	
		Change the subject of a complex formula	
		Algebraic Proof	
		Functions & function notation	
		Inverse functions	
		Composite functions	
18		**Vectors and geometric proof**	
		Understand represent and use vector notation, including column notation	
		Find the length of a vector	
		Calculate the resultant of a vector	
		Geometric problems in 2D where vectors are divided in a given ratio.	
		Geometrical proofs to prove points are collinear & vectors/lines are parallel	
19	a	**Reciprocal and exponential graphs; Gradient and area under graphs**	
		Recognise, sketch and interpret reciprocal graphs	
		Calculate and interpret the area under a curve	
		Calculate and interpret gradient of a tangent to a curve	
	b	**Direct and inverse proportion**	
		Recognise and interpret graphs of direct & inverse proportion	
		Set up and use formulae for direct & inverse proportion	

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