Level 2 Extended Mathematics Certificate Revision Checklist

Left column

Unit		Topic	RAG
1 Number		**Integers**	
	1.1	Use index notation including fractional and negative indices	
		Solve equations where the unknown is a power	
		Surds	
	1.2	Simplify surd expressions	
		Expand and simplify with surds	
		Calculate exactly with surds	
		Rationalising denominators	
	1.3	Rationalise the denominator involving simple surds	
		Rationalise the denominator involving surds which require simplifying first	
2 Algebraic Manipulation	2.1	**Algebraic indices**	
		Use index notation including fractional and negative indices in expressions	
		Expanding brackets	
	2.2	Expand two or three expressions	
		Use Pascal's triangle to expand simple binomial expressions	
		Use Pascal's Triangle to expand more complex binomial expansions	
		Factorising	
	2.3	Factorise quadratic expressions including using difference of two squares	
		Use and understand the factor theorem	
		Factorise cubic expressions (by method of inspection or polynomial division)	
		Completing the square	
	2.4	Understand algebraic perfect squares, $a^2+2ab+b^2$	
		Completing the square including where the coefficient of x^2 is not 1 and the coefficient of x is not even	
		Algebraic fractions	
	2.5	Simplify algebraic fractions	
		Add, subtract, multiply and divide algebraic fractions	
3 Graphs		**Linear graphs**	
	3.1	Understand and use the equation of a straight line, including the forms $y-y_1=m(x-x_1)$ and $ax+by+c=0$.	
		Generate equations of parallel and perpendicular lines	
		Solve problems involving parallel and perpendicular lines	
		Quadratic graphs	
	3.2	Indentify and interpret roots, intercepts & turning points of a quadratic graph	
		Indentify and interpret roots, intercepts & turning points of a quadratic function algebraically	
		Understand and use the discriminant	
		Sketch quadratics	
		Cubic and quartic graphs	
	3.3	Recognise, sketch and interpret cubic graphs	
		Recognise, sketch and interpret quartic graphs	
		Trigonometric graphs	
	3.4	Recognise, sketch and interpret graphs of the trigonometric functions	
		Know exact trig values	
		Solve trigonometric equations	
4 More graphs		**Translating and reflecting graphs**	
	4.1	Sketch reflections and/or translations of a given function.	
		Interpret reflections/translations – work backwards to write the equation/function	
		Stretching graphs	
	4.2	Sketch stretches of a given function.	
		Interpret stretches (and combined transformations) – work backwards to write the equation/function	
		Circles	
	4.3	Recognise, sketch and use the equation of a circle in the form $(x-a)^2+(y-b)^2=r^2$	
		Find the equation of a radius and tangent to a circle	
		Find the radius and centre of a circle by completing the square	
		Solve problems involving the equation of a circle and other graphs	
		Exponential and reciprocal graphs	
	4.4	Recognise, sketch/plot and interpret reciprocal graphs	
		Recognise, sketch/plot and interpret exponential graphs	
		Plot and interpret graphs of non-standard functions in real contexts to find approximate solutions to problems, e.g. kinematic problems	
		Non-linear graphs	
	4.5	Calculate or estimate gradients of graphs	
		Interpret the gradient in real-life contexts	
		Calculate or estimate areas under graphs (including quadratic and other non-linear graphs) including the use of the trapezium rule	
		Interpret the area under a graph in real-life contexts	

Right column

Unit		Topic	RAG
5 Functions		**Functions**	
	5.1	Identify the domain and range of a function	
		Identify if a function has asymptotes and if so where they are	
		Composite functions	
	5.2	Understand and find composite functions	
		Sketch the graphs of composite functions	
		Inverse functions	
	5.3	Understand and find inverse functions	
		Find inverse functions of quadratic functions by completing the square	
		Sketch the graphs of inverse functions	
		Transforming functions	
	5.4	Transform functions	
		Write the algebraic equation of transformed functions	
6 Equations and inequalities		**Solve equations**	
	6.1	Solve equations with one unknown algebraically (including those with the unknown on both sides of the equation).	
		Solve equations involving algebraic fractions	
		Solve quadratic equations	
	6.2	Solve quadratic equations algebraically by factorising, by completing the square and by using the quadratic formula.	
		Solve quadratic equations which involve trigonometry	
		Solve other 'hidden quadratics' e.g. including $\sqrt{x}$ or x^4	
		Solve simultaneous equations	
	6.3	Solve simultaneous equations by substitution	
		Solve simultaneous equations where one equation is a quadratic graphically	
		Solve simultaneous equations where one equation is a quadratic algebraically	
		Solving inequalities	
	6.4	Use set notation	
		Solve linear and quadratic inequalities	
		Represent linear and quadratic inequalities graphically	
		Solve problems involving linear programming	
7 Pythagoras and trigonometry	7.1	**Pythagoras and trigonometry**	
		Know exact trig values	
		Use Pythagoras' Theorem and trigonometry in 3D	
		Sine and cosine rules and area of a triangle	
	7.2	Use the formula for area of a triangle in 2D and 3D problems	
		Use the sine rule in 2D and 3D problems	
		Use the cosine rule in 2D and 3D problems	
8 Probability		**The language of probability**	
	8.1	Calculate with probability	
		Venn diagrams & set notation	
		Tree diagrams	
		Probability Problems	
	8.2	Calculate and interpret conditional probabilities	
		Calculations with conditional probability that lead to solving linear and/or quadratic equations.	
9 Proof	9.1	**Proof by deduction**	
		Proof by exhaustion and disproof by counter example	
	9.2	Proof by exhaustion	
		Proof by disproof using a counter example	
		Geometric proofs	
	9.3	Circle Theorems	
		Congruency and Similarity	
		Coordinate geometry	
10 Vectors	10	**Position vectors**	
		Understand and use position vectors	
		Calculate the distance between two points represented by position vectors	
	10	**Solving geometric problems**	
		Geometrical proofs involving vectors	

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