Curriculum Map

Subject: Pure Maths **Year Group: 12**

	Autumn 1/Autumn 2	Autumn 2	Autumn 2/Spring 1	Spring 2	Summer 1	Summer 2
Content	• Transition to Year 12 • Unit 1: Algebra and functions • Unit 2: Quadratic functions. • Unit 3: Equations and inequalities	• Unit 4: Graphs. • Unit 5: Straight-line graphs.	• Unit 6: Circles. • Unit 7: Further algebra • Unit 8: The binomial expansion.	• Unit 9: Trigonometric ratios and graphs. • Unit 10: Trigonometric identities and equations.	• Unit 11: Vectors (2D). • Unit 12: Differentiation.	• Unit 13: Integration. • Unit 14: Exponentials and logarithms.
Skills	Students will… **Transition:** Lay the foundation for year 12. **Unit 1:** Expand and factorise expressions. Use the laws of indices. Simplify surds and rationalise the denominator. **Unit 2:** Factorise quadratics. Solve quadratics. Solve problems using the discriminants. **Unit 3:** Solve linear and quadratic simultaneous equations.	Students will… **Unit 4:** Sketch the graphs of cubic, quartic and reciprocal functions. **Unit 5: Straight-line graphs.** Calculate the gradient of a line joining a pair of point. Understand the link between the equation of a line, and its gradient and intercept. Find the equation of a line given (i) the gradient and one point on the line or (ii) two points on the line.	Students will… **Unit 6:** Find the mid-point of a line segment. Find the equation of the perpendicular bisector to a line segment. Know how to find the equation of a circle. Solve geometric problems involving straight lines and circles. Use circle properties to solve problems on coordinate grids. Find the angle in a semicircle and solve other problems involving circles and triangles.	Students will… **Unit 9:** Use the cosine rule to find a missing side or angle. Use the sine rule to find a missing side or angle. Find the area of a triangle using an appropriate formula. Solve problems involving triangles. Sketch the graphs of the sine, cosine and tangent functions. Sketch simple transformations of these graphs. **Unit 10:** Calculate the sine, cosine and	Students will… **Unit 11:** Use column vectors and carry out arithmetic operations on vectors. Calculate the magnitude and direction of a vector. Understand and use position vectors. Use vectors to solve geometric problems. Understand vector magnitude and use vectors in speed and distance calculations. Use vectors to solve problems in context.	Students will… **Unit 13:** Find y given $\frac{dy}{dx}$ for xn. Integrate polynomials. Find f(x), given f'(x) and a point on the curve. Evaluate a definite integral. Find the area bounded by a curve and the x-axis. Find areas bounded by curves and straight lines. **Unit 14:** Sketch graphs of the form y = ax, y = ex, and transformations of these graphs.

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	Interpret algebraic solutions of equations graphically. Solve linear and quadratic inequalities. Interpret inequalities graphically.	Find the point of intersection for a pair of straight lines. Know and use the rules for parallel and perpendicular gradients. Solve length and area problems on coordinate grids. Use straight line graphs to construct mathematical model.	**Unit 7:** Cancel factors in algebraic fractions. Divide a polynomial by a linear expression. Use the factor theorem to factorise a cubic expression. Construct mathematical proofs using algebra. Use proof by exhaustion and disproof by counter-example. **Unit 8:** Use Pascal's triangle to identify binomial coefficients. Use combinations and factorial notation. Use the binomial expansion to expand brackets. Find individual coefficients in a binomial expansion.	tangent of any angle. Know the exact trigonometric ratios for 30°, 45° and 60°. Know and use the relationships tan θ ; _____ sin θ cos θ and sin2 θ + cos2 θ. Solve simple trigonometric equations of the forms sin θ = k, cos θ = k and tan θ = k. Solve more complicated trigonometric equations of the forms sin nθ = k and sin (θ ± a) = k and equivalent equations involving cos and tan. Solve trigonometric equations that produce quadratics	**nit 12:** Find the derivative, f9(x) or dy___ dx , of a simple function. Use the derivative to solve problems involving gradients, tangents and normal. Identify increasing and decreasing functions. Find the second order derivative, f 0(x) or d2y ____ dx2 , of a simple function. Find stationary points of functions and determine their nature. Sketch the gradient function of a given function. Model real-life situations with differentiation.	Differentiate ekx and understand why this result is important. Use and interpret models that use exponential functions. Recognise the relationship between exponents and logarithms. Recall and apply the laws of logarithms. Solve equations of the form ax = b. Describe and use the natural logarithm function. Use logarithms to estimate the values of constants in non-linear model.

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			Make approximations using the binomial expansion.			
Key questions	Edexcel AS Book Mixed Exercise 1, Page 15 Mixed Exercise 2 , Page 35 Mixed Exercise 3 , Page 56	Edexcel AS Book Mixed Exercise 4, Page 82 Mixed Exercise 5 , Page 108	Mixed Exercise 6 , Page 132 Mixed Exercise 7, Page 154 Mixed Exercise 8 , Page 169	Mixed Exercise 9 , Page 198 Mixed Exercise 10, Page 222	Edexcel AS Book Mixed Exercise 11 , Page 251 Mixed Exercise 12 , Page 282	Edexcel AS Book Mixed Exercise 13, Page 306 Mixed Exercise 14, Page 334
Assessment	End of Half Term Assessment Encompassing transition and unit 1-3	End of Half Term Assessment Unit4-5	End of Half Term Assessment Unit6-8	End of Half Term Assessment Unit6-8	End of Year Assessment AS-paper 2hr (no unit 14)	End of Half Term Assessment
Literacy/ Numeracy/ SMSC/ Character	Understanding and interpreting calculations used in mathematical modelling problems set in real-life contexts. Carrying out algebraic proofs of mathematical identities or formulae used in solving problems. Aspiration, Resilience, Initiative, Confidence	Understanding and interpreting calculations used in mathematical modelling problems set in real-life contexts. Carrying out algebraic proofs of mathematical identities or formulae used in solving problems. Aspiration, Resilience, Initiative, Confidence	Understanding and interpreting calculations used in mathematical modelling problems set in real-life contexts. Carrying out algebraic proofs of mathematical identities or formulae used in solving problems. Aspiration, Resilience, Initiative, Confidence	Understanding and interpreting calculations used in mathematical modelling problems set in real-life contexts. Carrying out algebraic proofs of mathematical identities or formulae used in solving problems. Aspiration, Resilience, Initiative, Confidence	Understanding and interpreting calculations used in mathematical modelling problems set in real-life contexts. Carrying out algebraic proofs of mathematical identities or formulae used in solving problems. Aspiration, Resilience, Initiative, Confidence	Preparation for A2