

Curriculum Overview – Autumn Term 2022-2023

Subject: Mathematics

Year group: 12, International A Level – Pure Mathematics 1

Unit number	Unit name	Key learning aspects (knowledge, understanding, skills)	Key assessment opportunities
1	Algebraic Expressions	<ul style="list-style-type: none"> • Multiply and divide integer powers • Expand a single term over brackets and collect like terms • Expand a single term over brackets and collect like terms • Expand the product of two or three expressions • Factorise linear, quadratic and simple cubic expressions • Know and use the laws of indices • Simplify and use the rules of surds • Rationalise denominators 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment
2	Quadratics	<ul style="list-style-type: none"> • Solve quadratic equations using factorization, the quadratic formula and completing the square • Read and use $f(x)$ notation when working with functions • Sketch the graph and find the turning point of a quadratic function • Find and interpret the discriminant of a quadratic expression 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment

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3	Equations and Inequations	<ul style="list-style-type: none"> • Solve linear simultaneous equations using elimination or substitution • Solve simultaneous equations: one linear and one quadratic • Interpret algebraic solutions of equations graphically • Solve linear inequalities • Solve quadratic inequalities • Interpret inequalities graphically • Represent linear and quadratic inequations graphically 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment
4	Graphs and Transformations	<p>After completing this chapter, you should be able to:</p> <ul style="list-style-type: none"> • Sketch cubic graphs • Sketch reciprocal graphs of the form $y = \frac{a}{x}$ and $y = \frac{a}{x^2}$ • Use intersection points of graphs to solve equations • Translate graphs • Sketch graphs • Transform graphs of unfamiliar functions 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment
5	Straight Line Graphs	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Calculate the gradient of a line joining a pair of points • Understand the link between the equation of a line, and its gradient and y-intercept • Find the equation of a line given (i) the gradient and one point on the line or (ii) two points on the line • Know and use the rule for parallel and perpendicular gradients • Find the point of intersection for a pair of straight lines • Solve length and area problems on coordinate grids 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment

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6	Trigonometric Ratios	After completing this chapter, you should be able to: <ul style="list-style-type: none"> • 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 graph of the sine, cosine tangent functions • Sketch simple transformations of these graphs 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment
7	Radians	After completing this chapter, you should be able to: <ul style="list-style-type: none"> • Convert between degrees and radians, know exact values of angles measured in radians • Find areas of sectors and segments using radians 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment
8	Differentiation	After completing this chapter, you should be able to: <ul style="list-style-type: none"> • Find the derivative, $f'(x)$ or $\frac{dy}{dx}$, of a simple function • Use the derivative to solve problems involving gradients, tangents and normal • Find the second derivative, $\frac{d^2y}{dx^2}$, of a simple function 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • End of unit assessment
9	Integration	After completing this chapter, you should be able to: <ul style="list-style-type: none"> • Find y given $\frac{dy}{dx}$ for x^n • Integrate polynomials • Find $f(x)$, given $f'(x)$ and a point on the curve 	<ul style="list-style-type: none"> • Regular Homework • Oral responses in class • Observations of the standard of written solutions • Mock assessment