

## 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	<p>After completing this chapter, you should be able to:</p> <ul style="list-style-type: none"> <li>• Multiply and divide integer powers</li> <li>• Expand a single term over brackets and collect like terms</li> <li>• Expand the product of two or three expressions</li> <li>• Factorise linear, quadratic and simple cubic expressions</li> <li>• Know and use the laws of indices</li> <li>• Simplify and use the rules of surds</li> <li>• Rationalise denominators</li> </ul>	<ul style="list-style-type: none"> <li>• Regular Homework</li> <li>• Oral responses in class</li> <li>• Observations of the standard of written solutions</li> <li>• End of unit assessment</li> </ul>
2	Quadratics	<p>After completing this chapter, you should be able to:</p> <ul style="list-style-type: none"> <li>• Solve quadratic equations using factorization, the quadratic formula and completing the square</li> <li>• Read and use <math>f(x)</math> notation when working with functions</li> <li>• Sketch the graph and find the turning point of a quadratic function</li> <li>• Find and interpret the discriminant of a quadratic expression</li> </ul>	<ul style="list-style-type: none"> <li>• Regular Homework</li> <li>• Oral responses in class</li> <li>• Observations of the standard of written solutions</li> <li>• End of unit assessment</li> </ul>

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

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