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| **Year 2 pure unit 1: Algebraic methods and proof** | **Road Map** |
| In this unit you will learn about pure maths. The aims are as follows:**LG1**: Knowledge**LG2**: Application**LG3**: Skills | Assessment Grades |  |  |
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| **Themes** | **Learning Goals/Outcomes/Content** |  |  |  |
| **1a. Proof** | understand that various types of proof can be used to give confirmation that previously learnt formulae are true, and have a sound mathematical basis; |  |  |  |
| understand that there are different types of proof and disproof (e.g. deduction and contradiction), and know when it is appropriate to use which particular method; |  |  |  |
| be able to use an appropriate proof within other areas of the specification later in the course. |  |  |  |
| **1b. Simplifying algebraic fractions** | be able to add, subtract, multiply and divide algebraic fractions; |  |  |  |
| know how to use the factor theorem to shown a linear expression of the form $\left(a+bx\right)$ is a factor of a polynomial; |  |  |  |
| know how to use the factor theorem for divisors of the form $(a+bx)$; |  |  |  |
| be able to simplify algebraic fractions by fully factorising polynomials up to cubic. |  |  |  |
| **1c. Partial fractions** | be able to split a proper fraction into partial fractions; |  |  |  |
| be able to split an improper fraction into partial fractions, dividing the numerator by the denominator (by polynomial long division or by inspection). |  |  |  |

**Links:**

LG1: You will learn how to structure different types of mathematical proof, how to simplify algebraic fractions and how to decompose rational functions into partial fractions.

LG2: You will learn how to apply your knowledge of given proofs to unfamiliar proofs and to apply your knowledge of proof structures to formulate proofs in other mathematical disciplines such as trigonometry.

LG3: You will be able to solve a variety of routine and non-routine problems, by combining several Mathematical skill sets. For example, by making the link between decomposed partial fractions and the graphs of their functions, identifying which values might make the denominator zero.