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**LANGDON PARK SIXTH FORM**

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| **Subject: Mathematics** | **Year: Y13** | **Topic 1.1 Proof** |

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| ***What and Why*** “ Proof is key to mathematical thinking and is one of the overarching themes of Mathematics A Level. You will learn different methods of rigorously proving mathematical statements and explore important proofs around the infinity of prime numbers and of the irrationality of many square roots” |

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| **Key terms**  **Proof**  **Deduction**  **Counter-example**  **Exhaustion**  **Contradiction**  **Irrational**  **Infinity** | * **Key ideas** * Understand the asymmetry between proof and disproof * Understand that a single counter example disproves a statement * Understand and be able to apply proof by deduction, using algebra to generalise arguments * Understand and be able to apply proof by exhaustion, including knowing efficient methods to shorten this approach in cases such as proving a number is prime * Understand the logic of proof by contradiction * Understand Euclid’s proof of the infinity of primes * Understand the proof of the irrationality of the square root of 2 * Understand and apply the Fundamental Theorem of Arithmetic to generalise to the proof of the irrationality of square roots of all non-perfect square natural numbers |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Independent learning** | **Extension – Cultural Capital and Reading** |
| OT1.1; OT1.2; A1 | **Topics you should be confident in prior to unit:**  Basic algebraic manipulation  Properties of numbers- factors, primes, squares  Fundamental Theorem of arithmetic  **Websites: Review of all GCSE Higher proof material** <https://www.bbc.co.uk/bitesize/guides/zcqmsrd/revision/8> | * End of unit assessment which will also include review of selected year 12 material * 50% seen * 50% unseen * 90% pass needed or resit required. | Kerboodle Online Login  My Maths  Exam Solutions  Maths Genie | **Article**: **Extensive article with lots of good and interesting examples of mathematical proo**f  <https://www.cut-the-knot.org/proofs/index.shtml>  **Article on Nrich on proof by contradiction:**  [**https://nrich.maths.org/4717**](https://nrich.maths.org/4717) |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment | | |

**Revision planning**

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| Spec point | Notes complete | Revision materials | Past paper Qs | Timed conditions |
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