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**LANGDON PARK SIXTH FORM**

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| **Subject: Mathematics** | **Year: Y13** | **Topic 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 manipulationProperties of numbers- factors, primes, squaresFundamental 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 LoginMy MathsExam SolutionsMaths 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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