Half Term 1

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| **What will be learning?**    **Teacher 1 and 2**  Pure Chapter 1 - Algebraic Expressions  Pure Chapter 2 – Quadratics  Pure Chapter 3 – Equations and inequalities  Pure Chapter 4 – Graphs and transformations  Pure Chapter 8 – The binomial Expansion | **Why this? Why now?**    Recap required skills from GCSE and build a confident foundation.    We complete binomial expansion in preparation for statistics | **Key Words:**    Base  Domain  Range  Roots  Turning point  Discriminant  Asymptotes  Rationalise |
| **Helpful hints**    Solving with indices and surds has appeared in the AS and A Level papers all the time!    Stealth quadratics, quadratics which are not obvious quadratics, for example:  come up in the exam regularly.  These occur in question 7 Exercise 2E | |
| **What opportunities are there for wider study?**  Try these tricky questions: | |
| **How will I be assessed?**     Topic test 1 (Pure Chapter 1- 4) | |

Half term 2

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| **What will we be learning?**    **Teacher 1**    Pure Chapter 5 – Straight Line Graphs  Pure Chapter 6 – Circles    **Teacher 2**    Applied Chapter 1 – Data Collection  Applied Chapter 2 – Measures of location and spread  Applied Chapter 3 – Representation of data  Applied Chapter 4 – Correlation | **Why this? Why now?**    Statistics is a brilliant introduction into applied mathematics | **Key Words:**    Normal  Tangent  Chord  Population  Sampling units  Sampling frame  Simple random sample  Systematic sampling  Stratified sampling  Quota sampling  Opportunity sampling  Quantitative variables and data  Qualitative variables and data  Continuous variable  Discrete variable  Classes  Mode or modal class  Median  Mean  Lower quartile  Upper quartile  Range  Interquartile range  Interpercentile range  Variance  Standard deviation  Bivariate data  Correlation  Regression line |
| **Helpful hints**    The discriminant is key when exploring tangents to circles.    Make flash cards for the definitions in Chapter 1 applied | |
| **What opportunities are there for wider study?**    Try working in location planning:  <https://amsp.org.uk/resource/sampling-and-summary-statistics>        Try being a Software Engineer:  <https://amsp.org.uk/resource/geometry-and-straight-line-graphs> | |
| **How will I be assessed?**     Topic test 2 (Pure Chapters 5, 6 and 8)   Topic test 3 (Applied Chapters 1 – 4) | |

Half term 3

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| **What will we be learning?**    **Teacher 1**    Pure Chapter 12 – Differentiation  Pure Chapter 13 – Integration  Pure Chapter 11 – Vectors    **Teacher 2**    Applied Chapter 5 – Probability  Applied Chapter 6 –  Statistical distributions  Applied Chapter 7 – Hypothesis testing | **Why this? Why now?**    Need a solid foundation in all of vectors, differentiation and integration to start the mechanics chapters. | **Key Words:**    Gradient  Curve  Tangent  Increasing  Decreasing  Stationary point  Local minimum  Local maximum  Point of inflection  Vann diagram  Mutually exclusive  Independent  Tree diagram  Probability distribution  Binomial distribution  Null hypothesis  Alternative hypothesis  Significance level  Critical region |
| **Helpful hints**    To differentiate and integrate start by simplifying your expression to get single powers of x    Diagrams are key to Vectors    Hypothesis Testing – See Example 5 p.105 from the textbook for a great example of a test from start to finish | |
| **What opportunities are there for wider study?**      Try working for the Office of National Statistics: <https://www.ons.gov.uk/aboutus/careers>          Try being an Actuary:  <https://amsp.org.uk/resource/risk> | |
| **How will I be assessed?**     Topic test 4 (Pure Chapter 12)   Topic test 5 (Pure Chapters 11 and 13) | |

Half term 4

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| **What will we be learning?**    **Teacher 1**    Applied Chapter 8 – Modelling in mechanics  Applied Chapter 9 – Constant acceleration    **Teacher 2**    Pure Chapter 9 – Trigonometric ratios  Pure Chapter 10 – Trigonometric identities and equations | **Why this? Why now?**    Having covered most of Year 1 Pure content you are now in a good position to tackle the challenging Mechanics side of the course and to start looking at trigonometric identities. | **Key Words:**    Particle  Lamina  Uniform body  Inextensible string  Smooth and rough surface  Friction  Tension  Compression  Thrust  Normal reaction  Magnitude  Scalar  Rate of change  Gradient  Gravity  Displacement  Velocity  Speed  SUVAT  Sine rule  Cosine rule  Area of a triangle  Periodic |
| **Helpful hints**    Diagrams are key to success at Mechanics | |
| **What opportunities are there for wider study?**  Try aspiring to be an astronaut:  <https://amsp.org.uk/resource/geometry-and-equations-of-motion> | |
| **How will I be assessed?**     Topic test 6 (Applied Chapters 5, 6 and 7)   Topic test 7 (Pure Chapters 9 and 10) | |

Half term 5

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| **What will we be learning?**    **Teacher 1**    Applied Chapter 10 – Forces and motion  Applied Chapter 11 – Variable acceleration    **Teacher 2**    Pure Chapter 14 – Exponentials and logarithms  Pure Chapter 7 – Algebraic methods | **Why this? Why now?**    Exponentials and logarithms always appear in the A Level exam, however is not revisited in Year 13 so we cover this now to keep it fresh in your minds in Year 13.  Algebraic Methods and Proof work is the last topic from Year 1 / AS covered and the first topic in A Level / Year 2 covered. | **Key Words:**    Resultant  Vectors  Differentiate  Integrate  F=ma  W=mg  Factor theorem  Deduction  Exhaustion  Counter-example |
| **Helpful hints**    Some of the trickier questions from Year 1 Proof can be best tackled using the Year 2 Proof method ‘Proof by Contradiction’      Remember the  Variable Acceleration diagram | |
| **What opportunities are there for wider study?**     Try working in Orthotics and Prosthetics:  <https://amsp.org.uk/resource/angles-and-forces> | |
| **How will I be assessed?**     Topic test 8 (Applied Chapters 9 and 10)   Topic test 9 (Pure Chapters 7 and 14) | |

Half term 6

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| **What will we be learning?**    **Teacher 1 and 2**    **Book 2**  Pure Chapter 1 – Algebraic Methods  Pure Chapter 2 – Functions and graphs  Pure Chapter 3 – Sequences and series  Pure Chapter 4 – Binomial expansion | **Why this? Why now?**    We start the Year 2 Pure content in the summer of Year 12 to ensure there is time to complete the extensive SOW and still have time to revise before exams start in Year 13. | **Key Words:**    Resultant  Vectors  Differentiate  Integrate  F=ma  W=mg  Factor theorem  Deduction  Exhaustion  Counter-example |
| **Helpful hints**    Use a sketch of the graph to determine the range and domain:  Domain = Input = x  Range = Output = y    Solving modulus problems? – always use a sketch to determine whether you need the positive solution, the negative solution or both. | |
| **What opportunities are there for wider study?**    Try some of these mathematical puzzles, many of which contain A Level Mathematics:  <http://www.qbyte.org/puzzles/> | |
| **How will I be assessed?**    Mocks  Summer topic tests (Book 2 Pure Chapters 1-4) | |