Stage 1 General Mathematics – Semester 1 (Example 1)

Topic 1: Investing & Borrowing Topic 2: Measurement & Topic 3: Statistical Investigation

|  | **Lesson 1 – Single Lesson** | **Lesson 2 – Single Lesson** | **Lesson 3 – Double Lesson** |
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| **Term One**  **Week 1**  Mon 27th Jan | **Course Overview & Expectations**   * Including what to bring to class * Appropriate calculators | **TOPIC ONE: INVESTING AND BORROWING**  Investing money   * Why invest * Where can we invest * Types of investments * Fees & charges | What is Simple interest and how do we do simple interest calculations:   * Simple interest * Principal * Interest rate * Time invested in years * Total Return |
| **Week 2**  Mon 3rd Feb | Introduction to compound interest via spreadsheet calculations | Compound interest   * Derive the formula * Use the formula to find future value, interest earned and present value | Use the compound interest formula to find future value, interest earned and present value  Effect of changing the compounding period |
| **Week 3**  Mon 10th Feb | Annualised rates to compare investments | Compound interest using the graphic calculator   * Future value * Present value * Interest * Time * Comparison rate on savings | Simple verses Compound interest, which is better? |
| **Week 4**  Mon 17th Feb | Share Investments:   * The basics about the share market * Costs * Risks | Cost of buying and selling shares | Share calculations   * Breakeven point using brokerage rate and flat fee brokerage (formula only) * Dividend return on shares |
| **Week 5**  Mon 24th Feb | Expressing the return on an investment as a percentage of the original investment | The effect of tax and inflation on the real growth of the investment | **MATHEMATICAL INVESTIGATION 1** |
| **Week6**  Mon 3rd March | Credit Cards   * Why * Types * Costs | Personal Loans   * Fees/Charges * Interest | **MATHEMATICAL INVESTIGATION 1** |
| **Week 7**  Mon 10th March | Loans and Credit Cards verses Saving | REVISION | **INVESTING AND BORROWING**  **SAT 1** |
| **Week 8**  Mon 17th March | **TOPIC TWO: MEASUREMENT**  Measurement review:   * Measuring devices * Metric system conversion | Accuracy of Measurements:   * Estimating and measuring * Rounding to significant figures | Absolute and percentage error calculations  Scientific notation |
| **Week 9**  Mon 24th March | Pythagoras theorem review | Perimeter of simple and composite shapes including circles, sectors, quadrilaterals and triangles. | Area units and there conversion  Area of simple and composite shapes including circles, sectors, ovals, trapeziums and triangles |
| **Week 10**  Mon 31st  March | Areas of irregular shapes using simple shapes | Areas of irregular shapes using Simpsons rule | Calculating the surface area of standard and composite shapes including prisms, pyramids, cones, cylinders and spheres |
| **Week 11**  Mon 7th April | Volume:   * Units and how to convert between them * Connection between volume and capacity * How to convert between volume and capacity | Calculating the Volume of standard and composite shapes including prisms, pyramids, cones, cylinders and spheres | Calculating the Volume of standard and composite shapes including prisms, pyramids, cones, cylinders and spheres  Irregular volume calculations   * Prismatic model * Conical model |
| Term Two  **Week 1**  Mon 28th April | Scales:   * How does a scale factor work * Calculating actual lengths and scaled measurements | Scales:   * Drawing scaled diagrams * Determining scale factor | Scale problems involving area and volumes  What is a rates and how do we convert between rates |
| **Week 2**  Mon 5th May | REVISION | **MEASUREMENT**  **SAT 2** | **TOPIC THREE: STATISTICAL INVESTIGATION**  Students look at statistics presented and the statistical process that would have underpinned these statistics |
| **Week 3**  Mon 12th May | Samples:   * What is a sample * Why do we sample * Bias in samples | Sampling Methods and their advantages and disadvantages:   * Simple random * Stratified * Systematic | Categorical data (Ordinal and Nominal) and how do we present this data (tables, bar and pie charts) |
| **Week 4**  Mon 19th May | Numerical data (Discrete and Continuous) and how do we present it (dot plot, stem plot and histogram) | Numerical data (Discrete and Continuous) and how do we present it (dot plot, stem plot and histogram)  Outliers, the effect on distributions and what should we do with them. | Calculation of measures of central tendency and spread:   * Mean * Median   How do we tell what is the most appropriate measure of the average? |
| **Week 5**  Mon 26th May | Box and Whisker diagrams | Calculation of measures of central tendency and spread:   * Range * Interquartile range * Standard Deviation | Impact of sample size |

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| **Week 6**  Mon 2nd June | Putting it altogether for numerical data:   * Graphical Representation * Dealing with outliers * Shape of the distribution * Measures of centre of spread * Argument to support conjecture | Putting it altogether for numerical data:   * Graphical Representation * Dealing with outliers * Shape of the distribution * Measures of centre of spread * Argument to support conjecture | Putting it altogether categorical   * Table of counts * Graphical Representation * Identification of the mode * Calculation of proportions * Argument to support conjecture |
| **Week 7**  Mon 9th June | REVISION | **STATISTICAL INVESTIGATION**  **SAT 3** | EXAM REVISION |
| **Week 8**  Mon 16th June | EXAM REVISION | EXAM REVISION | **MID YEAR EXAM - FORMATIVE** |

General Mathematics – Semester 2

Topic 4: Applications of Trigonometry Topic 5: Linear Equations (Functions) & their graphs & Topic 6: Matrices & Networks

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|  | **Lesson 1 – Single Lesson** | **Lesson 2 – Single Lesson** | **Lesson 3 – Double Lesson** |
| Term Two  **Week 9**  Mon 23 June | Work Experience | | |
| **Week 10**  Mon 30th June | **TOPIC FOUR: APPLICATIONS OF TRIGONOMETRY**  Similar triangles   * Conditions needed to prove similarity * Using similar triangles to solve problems | Using similar triangles to solve problems in practical contexts | Review the use of Pythagoras’ rule and trigonometric ratios to solve contextual problems in 2D |
| Term Three  **Week 1**  Mon 21st July | Applying Pythagoras’ rule and trigonometric ratios to solve contextual problems in 3D | Area of non-right angled triangles using one angle and two sides | Area of non-right angled triangles using its three sides (Heron’s rule) |
| **Week 2**  Mon 28th July | The Cosine Rule   * Finding an unknown side | The Cosine Rule   * Finding an unknown angle | The Sine Rule   * Finding an unknown side * Finding an unknown angle and the ambiguous case |
| **Week 3**  Mon 4th Aug | Contextual applications of the sine and cosine rules | Problems involving bearings | REVISION |
| **Week 4**  Mon 11th Aug | **APPLICATIONS OF TRIGONOMETRY**  **SAT 1** | **TOPIC FIVE: LINEAR FUNCTIONS AND THEIR GRAPHS**  Introduction to linear relationships   * Description of the contextual linear relationship. * Creating a table of values. * Taking the table of values to a graph. * What rule do we see? | Solving linear equations:   * Description of the contextual linear relationship. * Creating a table of values. * Taking the table of values to a graph. * Algebraic rule |

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| **Week 5**  Mon 18th Aug | Solving linear relationship problems in context using graphs. | Solving problems using the algebraic rule   * Substitution and Evaluation * Rearrangement * Solving linear equations | Looking at the links between the four methods of representing a linear relationship   * Y -intercept * Slope |
| **Week 6**  Mon 25th Aug | Simultaneous equations   * Finding where two lines meet on a graph (without electronic technology) | Simultaneous equations   * Finding where two lines meet on a graph (without electronic technology) | Solving simultaneous equations with electronic technology   * Graphically (including being able to rearrange equation to go into the calculator) * Using the equation solver |
| **Week 7**  Mon 1st Sept | Simultaneous equations   * Non-unique solutions | Piecewise linear functions | **MATHEMATICAL INVESTIGATION 1** |
| **Week 8**  Mon 8th Sept | Step Functions | Where do piecewise and step functions occur:   * Construction of the formula * Graphing these relationships * Solving problems using algebraic and graphical representations | **MATHEMATICAL INVESTIGATION 1** |
| **Week 9**  Mon 15th Sept | Where do piecewise and step functions occur:   * Construction of the formula * Graphing these relationships * Solving problems using algebraic and graphical representations | REVISION | **LINEAR FUNCTIONS**  **SAT 2** |
| **Week 10**  Mon 22nd Sept | **TOPIC SIX: MATRICES AND NETWORKS**  What is a matrix? Where are they used?   * Columns and rows * Order | Multiplication by a scalar  Adding and subtracting matrices | Using matrices to set up costing and stock control problems |

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| Term Four  **Week 1**  Mon 13th October | Matrix multiplication by hand | Multiplying by a row or column of 1’s | Matrices using a graphic calculator   * Adding and Subtracting * Scalar multiplication * Matrix multiplication |
| **Week 2**  Mon 20th October | Costing matrices problems | What does a network diagram tell you?   * Reading information from a network diagram * Deducing relationships | Networks and connectivity matrices |
| **Week 3**  Mon 27th October | Powers of matrices and multi-stage connections (including limitation of higher powers) | Weighted sums of powers   * Measures of efficiency or redundancy * Prediction in dominance relationships | Connectivity and dominance problems Reasonableness of weightings and limitations of the model |
| **Week 4**  Mon 3rd November | Transition Matrices   * What can we use them for * Setting up matrices   Predicting future trends | 2x2 Transition Matrices problems including:   * The steady state * Limitations of the matrix model | Transition Matrices   * 3x3 or higher systems |
| **Week 5**  Mon 10th November | Transition Matrices   * 3x3 or higher systems | REVISION | **MATRICES SAT 3** |
| **Week 6**  Mon 17th November | EXAM REVISION | EXAM REVISION | EXAM REVISION |
| **Week 7**  Mon 24th November | EXAMINATION (formative)  For students going onto Stage 2 General Maths, undertaking an exam is good preparation for what to expect in Stage 2. | | |