

## Year 12 Pure

### Teacher A

### Teacher B

#### Algebra

- Expanding brackets
- Factorising
- Indices
- Surds
- Rationalising surds
- Problem solving and surds

#### Quadratic functions

- Factorise quadratic function
- Completing the square and sketching graphs
- Use quadratic formula
- Sketching quadratic graphs
- Discriminant
- Modelling quadratic equations and problem solving

#### Coordinate Geometry

- Coordinates of midpoint
- Length of a line segment
- Gradient of a line
- Equation of straight line
- Gradient of parallel and perpendicular lines
- Equation of parallel and perpendicular line
- Coordinate geometry and problem solving

#### Equations and Inequalities

- Simultaneous equations in two variables
- Simultaneous with one linear and one quadratic function
- Simultaneous equation and the application of discriminant
- Simple linear inequalities
- Quadratic inequalities and graphical demonstration of solutions
- Solution satisfying two or more inequalities
- Regions and inequalities

#### Initial Assessment (Suitability Test)

<p>Circle Geometry</p> <ul style="list-style-type: none"> <li>• Equation of circle</li> <li>• Completing the square to find radius and centre of a circle</li> <li>• Intersection of a circle and straight lines</li> <li>• Properties of a circle <ul style="list-style-type: none"> <li>- Angles in a semi-circle is a right angle</li> <li>- A straight line from the centre is a perpendicular bisector of a chord</li> <li>- A radius is perpendicular to a tangent at the point of contact</li> </ul> </li> <li>• Equation of tangents and normal to a circle</li> <li>• Modelling with circles</li> </ul>	<p>Graphs and transformation</p> <ul style="list-style-type: none"> <li>- Sketch cubic graphs</li> <li>- Sketch quartic graphs</li> <li>- Other types of graphs</li> <li>- Intersection of graphs to solve equations</li> <li>- Reflection of functions</li> <li>- Translation of functions</li> <li>- Stretching functions</li> </ul>
--	--

Assessment 2

<p>Trigonometry</p> <ul style="list-style-type: none"> <li>- Area of triangle</li> <li>- Sine rule</li> <li>- Cosine rule</li> <li>- Trigonometric graphs</li> <li>- The trig identity <math>\tan x = \frac{\sin x}{\cos x}</math></li> <li>- Use the trig identity <math>\sin^2 x + \cos^2 x = 1</math></li> <li>- Solve trig equations in a given interval including quadratic equations involving multiple of unknown angles</li> </ul>	<p>Polynomial</p> <ul style="list-style-type: none"> <li>- Simplifying algebraic fractions</li> <li>- Dividing polynomials</li> <li>- The factor theorem</li> <li>- The remainder theorem</li> <li>- Factorising polynomial</li> <li>- Sketching polynomial functions</li> <li>- Solve equations</li> <li>- Algebraic proofs</li> </ul>
<p>Differentiation</p> <ul style="list-style-type: none"> <li>- Differentiation of a term</li> <li>- Differentiation of a polynomial</li> <li>- Differentiation from the first principle</li> <li>- Sketch gradient function of a function</li> <li>- Equation of tangents and normal</li> <li>- Second derivatives</li> <li>- Stationary point</li> <li>- Nature of stationary point</li> <li>- Modelling with differentiation</li> </ul>	<p>Binomial Expansion</p> <ul style="list-style-type: none"> <li>- Factorial and combination</li> <li>- Binomial expansion using pascal triangle</li> <li>- Binomial expansion using formula</li> <li>- Problem solving and binomial expansion</li> </ul>
<p>Exponentials</p> <ul style="list-style-type: none"> <li>- Exponential graphs, <math>y = a^x</math> and <math>y = e^x</math></li> </ul>	<p>Vectors</p> <ul style="list-style-type: none"> <li>- Vectors in two dimensions</li> </ul>

<ul style="list-style-type: none"> <li>- Differentiate <math>e^{kx}</math></li> <li>- Laws of logarithm</li> <li>- Solve equations with exponential terms</li> <li>- Parameters of exponential functions</li> <li>- Exponential growth and decay</li> </ul>	<ul style="list-style-type: none"> <li>- Magnitude and direction of a vector</li> <li>- Adding and subtracting vectors</li> <li>- Scalar multiplication</li> <li>- Distance between two position vectors</li> <li>- Modelling with vectors</li> </ul>
	<p>Integration</p> <ul style="list-style-type: none"> <li>- Know integration as the reverse of differentiation</li> <li>- Indefinite integral</li> <li>- Definite integral</li> <li>- Equation of a curve from its gradient</li> <li>- Area under a curve</li> </ul>
<b>Mock Exam</b>	

Year 12 Applied	
Teacher A - Statistics	Teacher B- Mechanics
<p>Data presentation and interpretation</p> <ul style="list-style-type: none"> <li>- Measure of location (mean, median and mode)</li> <li>- Measure of variation (standard deviation, variance, range and interquartile range)</li> <li>- Interpret and draw inferences from measure of location and variation.</li> <li>- Understand and apply coding to measure of location and spread</li> </ul>	<p>Quantities and units in mechanics</p> <ul style="list-style-type: none"> <li>- Units of measurement of time, mass, displacement, velocity, acceleration, force and weight</li> <li>- Difference between position, displacement and distance</li> <li>- Difference between mass and weight</li> <li>- Derive velocity, acceleration and</li> <li>- Mathematical modelling</li> <li>- Assumptions in mechanics</li> </ul>
<p>Data presentation and interpretation (part 2)</p> <ul style="list-style-type: none"> <li>- Draw and interpret box plot, cumulative frequency and histogram</li> <li>- Identify and interpret possible outlier</li> <li>- Compare two sets of data</li> <li>- Select and critique data presentation techniques</li> <li>- Clean up data including missing data, outlier and error</li> </ul>	<p>Kinematics 1</p> <ul style="list-style-type: none"> <li>- Language of kinematics</li> <li>- Speed time graph</li> <li>- Velocity time graphs</li> <li>- Displacement time graph</li> <li>- Derive and apply the SUVAT formula</li> <li>- Kinematics problems with constant acceleration</li> <li>- Vertical motion under gravity</li> </ul>
<p>Correlation and regression</p>	<p>Forces and Newton's laws of motion</p>

<ul style="list-style-type: none"> <li>- Interpret scatter diagrams of bivariate data</li> <li>- Interpret Regression lines for bivariate data</li> <li>- Make predictions with the regression line and understand its limitation</li> <li>- Understand informal interpretation of correlation</li> <li>- Know that correlation does not imply causation</li> <li>- Outlier and scatter graph/regression</li> <li>- Critique data presentation techniques in the context of the problem</li> </ul>	<ul style="list-style-type: none"> <li>- Types of forces</li> <li>- Forces in equilibrium</li> <li>- Newton's first law of motion</li> <li>- Application of Newton's second law of motion</li> <li>- Apply Newton's third law of motion</li> </ul>
<p>Probability</p> <ul style="list-style-type: none"> <li>- Mutually and independent events in calculating probabilities</li> <li>- Linking discrete and continuous distributions</li> <li>- Venn diagrams and its constituent parts</li> <li>- Probability tree diagrams</li> </ul>	<p>Kinematics 2 (Variable acceleration)</p> <ul style="list-style-type: none"> <li>- Use differentiation to model motion in a straight line for a particle moving with variable acceleration.</li> <li>- Gradient of relevant graphs links to rate of change</li> <li>- Find max and minimum velocity</li> <li>- Use integration to model motion in a straight line of a particle moving under the action of a variable force</li> <li>- Use integration to evaluate area under a graph</li> <li>- Use initial conditions to calculate the constant of integration.</li> </ul>
<p>Statistical distributions</p> <ul style="list-style-type: none"> <li>- Discrete probability distribution</li> <li>- Binomial distribution</li> <li>- Calculate probabilities using binomial distribution</li> </ul>	
<p>Statistical sampling</p> <ul style="list-style-type: none"> <li>- Population and sampling</li> <li>- Probabilistic sampling techniques, advantages and disadvantages</li> <li>- Non-probabilistic techniques, advantages, and disadvantages</li> <li>- Know how to use samples to make inferences about the population</li> <li>- Select and critique a sampling techniques in the context of solving a statistical problems</li> </ul>	

<ul style="list-style-type: none"> <li>- Know that the use of different types of sample can lead to different conclusions about a population</li> </ul>	
<p>Statistical hypothesis testing</p> <ul style="list-style-type: none"> <li>- Language of statistical hypothesis testing developed through binomial distribution</li> <li>- Conduct a statistical hypothesis testing for proportion in the binomial distribution and interpret results</li> <li>- Understand that the sample is being used make an inference about the population</li> <li>- Appreciate the fact that the significance level is the probability of rejecting the null hypothesis</li> <li>-</li> </ul>	
<b>Mock 2 Exam</b>	