**Australian MATHEMATICS Curriculum, F-10:**

**Proficiency Strands: Understanding, Fluency, Problem Solving and Reasoning**

**Content Strands: Number & Algebra, Measurement & Geometry, Statistics & Probability**

**For Year 10 A Maths Students:**

* **The 10A content is optional and is intended for students who require more content to enrich their mathematical study whilst completing the common Year 10 content. It is NOT anticipated that all students will attempt the 10A content, but doing so would be advantageous for students intending to pursue Mathematical Methods or Specialist Mathematics in the senior secondary years. A selection of topics from the 10A curriculum can be completed according to the needs of students.**

\*This document intends to assist teachers in their understanding of the Australian curriculum – it is merely an attempt to understand the document at this time – it combines description and elaboration statements. Teachers are advised to consult the online documentation to clarify further detail for themselves. The ‘AusVELS’ to be released during 2011 will be the official documentation for Victorian schools

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| **Number & Algebra:** | **Measurement & Geometry:** | **Statistics & Probability:** |
| **Real numbers:**   * Define rational & irrational numbers & perform operations with surds & fractional indices **-** *understand that the real number system includes irrational numbers & that certain subsets of the real number system have particular properties; apply the index laws to numeric & algebraic expressions & evaluate or simplify them as required* * Use the definition of a logarithm to establish & apply the laws of logarithms – *investigate the relationship between exponential & logarithmic expressions; investigate the use of logarithmic scale*   **Patterns & algebra:**   * Investigate the concept of a polynomial & apply the factor & remainder theorems to solve problems– *investigate the relationship between algebraic long division & the factor & remainder theorems*   **Linear & non-linear relationships:**   * Describe, interpret & sketch parabolas, hyperbolas, circles & exponential functions & their transformations– *using a range of strategies to investigate the effect of multiplying by a constant term, including negative numbers; connect the graphical & algebraic representations & describe the transformation* * Solve simple exponential equations – *investigate exponential equations derived from authentic mathematical models based on population growth* * Apply understanding of polynomials to sketch a range of curves & describe the features of these curves from their equation – *investigate the features of graphs of polynomials using digital technology* * Factorise monic & non-monic quadratic expressions & solve a wide range of quadratic equations derived from a variety of contexts – *develop fluency with algebraic techniques associated with quadratics to facilitate describing relationships & solving problems* | **Using units of measurement:**   * Solve problems involving surface area & volume of right pyramids, right cones, spheres & related composite solids – *use formulas to solve problems; use authentic situations to apply knowledge & understanding of surface area & volume*   **Geometric reasoning:**   * Prove & apply angle & chord properties of circles – *apply properties of circles to develop formal proofs*   **Pythagoras and trigonometry:**   * Establish the sine, cosine & area rules for any triangle & solve related problems – *apply knowledge and rules to authentic problems such as those involving surveying & design* * Use the unit circle to define trigonometric functions, & graph them with & without the use of digital technologies – *establish the symmetrical properties of trigonometric functions; investigate angles of any magnitude* * Solve simple trigonometric equations -  *understand that trigonometric functions are periodic & that this can be used to describe motion* * Apply Pythagoras’ theorem & trigonometry to solving three-dimensional problems in right-angled triangles – *investigate the applications of Pythagoras’ theorem in authentic problems* | **Chance:**   * Investigate reports of studies in digital media & elsewhere for information on the planning & implementation of such studies, & the reporting of variability – *evaluate media reports that refer to data from a range of contexts; evaluate whether graphs in a report could mislead, & whether graphs & numerical information support the claims; evaluate the appropriateness of sampling methods & sample size in reports where statements about population are based on a sample*   **Data representation & interpretation:**   * Calculate & interpret the mean & standard deviation of data & use these to compare data sets – *evaluate the appropriateness of sampling methods & sample size in reports where statements about a population are based on a sample* * Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation – *investigate different techniques for finding a ‘line of best fit’* |