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

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

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

**For Level10 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 through AusVELS – it combines description and elaboration statements. Teachers are advised to consult the online documentation to clarify further detail for themselves. ‘AusVELS’ is the official documentation for Victorian schools.

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| **Number & Algebra:** | **Measurement & Geometry:** | **Statistics & Probability:** |
| **Real numbers:**Define rational and irrational numbers and perform operations with surds and fractional indices (ACMNA264)* understanding that the real number system includes irrational numbers and that certain subsets of the real number system have particular properties
* applying the index laws to numeric and algebraic expressions and evaluating or simplifying them as required

Use the definition of a logarithm to establish and apply the laws of logarithms (ACMNA265)* investigating the relationship between exponential and logarithmic expressions
* investigating the use of logarithmic scale

**Patterns & algebra:**Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (ACMNA266)* investigating the relationship between algebraic long division and the factor and remainder theorems

**Linear & non-linear relationships:**Solve simple exponential equations (ACMNA270)* investigating exponential equations derived from authentic mathematical models based on population growth

Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (ACMNA267)* using a range of strategies to investigate the effect of multiplying by a constant term, including negative numbers
* connecting the graphical and algebraic representations and describing the transformation

Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (ACMNA268)* investigating the features of graphs of polynomials using digital technology

Factorise monic and non­monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts (ACMNA269)* developing fluency with algebraic techniques associated with quadratics to facilitate describing relationships and solving problems
 | **Using units of measurement:**Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids (ACMMG271)* using formulas to solve problems l using authentic situations to apply knowledge and understanding of surface area and volume

**Geometric reasoning:**Prove and apply angle and chord properties of circles (ACMMG272)* applying properties of circles to develop formal proofs

**Pythagoras and trigonometry:**Establish the sine, cosine and area rules for any triangle and solve related problems (ACMMG273)* applying knowledge of sine, cosine and area rules to authentic problems such as those involving surveying and design

Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies (ACMMG274)* establishing the symmetrical properties of trigonometric functions
* investigating angles of any magnitude

Solve simple trigonometric equations (ACMMG275)* understanding that trigonometric functions are periodic and that this can be used to describe motion
* using the notion of periodicity and symmetry to consider an infinite number of solutions

Apply Pythagoras’ theorem and trigonometry to solving three­ dimensional problems in right­angled triangles (ACMMG276)* investigating the applications of Pythagoras’s theorem in authentic problems
 | **Chance:**Investigate reports of studies in digital media and elsewhere for information on the planning and implementation of such studies, and the reporting of variability (ACMSP277)* evaluating media reports that refer to data from a range of contexts
* evaluating whether graphs in a report could mislead, and whether graphs and numerical information support the claims
* evaluating the appropriateness of sampling methods and sample size in reports where statements about a population are based on a sample

**Data representation & interpretation:**Calculate and interpret the mean and standard deviation of data and use these to compare data sets (ACMSP278) **ã** * evaluating the appropriateness of sampling methods and 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 (ACMSP279)* investigating different techniques for finding a ‘line of best fit’
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Reference : <http://ausvels.vcaa.vic.edu.au/>

This grid is an adaption of the information from the VCAA site to create a visual representation to assist teachers.

Cross-curriculum priorities to be included in all learning areas: Aboriginal and Torres Strait Islander histories and cultures (); Asia and Australia’s engagement with Australia (ã ); Sustainability ()