Craigslea State High School

….Educating Global Citizens

V19.1

Year Level Plan	Year 10	Semester 1	Extension Mathematics	Australian Curriculum

Term 1		Term 2	
Unit 1	**Unit 2**	**Unit 3**	**Unit 4**
In Unit 1 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes finding unknowns in formulas after substitution, • **fluency** includes finding unknown sides using trigonometry and pythagoras • **problem-solving** includes finding unknown lengths and angles using applications of trigonometry • **reasoning**	In Unit 2 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes determining probabilities of two- and three-step experiments • **fluency** • **problem-solving** includes investigating independence of events • **reasoning** includes interpreting and evaluating media statements and interpreting and comparing data sets.	In Unit 3 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs • **fluency** includes using a range of strategies to solve equations • **problem-solving** includes using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities • **reasoning** includes interpreting and evaluating media statements and interpreting and comparing data sets.	In Unit 4 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes applying the four operations to algebraic fractions, finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs • **fluency** includes factorising and expanding algebraic expressions, using a range of strategies to solve equations and using calculations to investigate the shape of data sets • **problem-solving** • **reasoning**
Assessment Tasks			
Summative Assessment Task 1: 2 x 60 - 70 min Tests at the end of Unit 1 **Approximately Week 7 Term 1** **Semester Weighting: 40%** **Students will:** • Solve right-angled triangle problems including those involving direction and angles of elevation and depression • Substitute values into formulas to determine an unknown • Define rational and irrational numbers and perform operations with surds and fractional indices • Establish the sine, cosine and area rules for any triangle and solve related problems • Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies • Solve simple trigonometric equations • Pythagoras' theorem and trigonometry to solving three-dimensional problems in right-angled triangles • Define rational and irrational numbers and perform operations with surds and fractional indices	**Students will:** • Describe the results of two- and three-step chance experiments, both with and without replacements, assign probabilities to outcomes and determine probabilities of events. Investigate the concept of independence • Use the language of 'if ... then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language	**Students will:** • Substitute values into formulas to determine an unknown • Solve problems involving linear equations, including those derived from formulas • Apply the four operations to simple algebraic fractions with numerical denominators • Solve linear inequalities and graph their solutions on a number line • Solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology • Solve problems involving parallel and perpendicular lines • Solve linear equations involving simple algebraic fractions	**Summative Assessment Task 2: 2 x 60 - 70 min** Test at the end of Unit 2, 3 and 4 **Approximately Week 9 Term 2** **Semester Weighting: 60%** **Students will:** • Factorise algebraic expressions by taking out a common algebraic factor • Expand binomial products and factorise monic quadratic expressions using a variety of strategies • Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate • Solve simple quadratic equations using a range of strategies • Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations [parabolas only] • Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation [parabolas only] • Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts

Year Level Plan	Year 10	Semester 2	Extension Mathematics

Term 3		Term 4	
Unit 5	**Unit 6**	**Unit 7**	**Unit 8**
In Unit 5 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs • **fluency** includes using calculations to investigate the shape of data sets • **problem-solving** • **reasoning** includes interpreting and evaluating media statements and interpreting and comparing data sets.	In Unit 6 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** • **fluency** • **problem-solving** • **reasoning** includes formulating geometric proofs involving congruence and similarity	In Unit 7 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes finding unknowns in formulas after substitution, comparing simple and compound interest in financial contexts • **fluency** includes using a range of strategies to solve equations and using calculations to investigate the shape of data sets • **problem-solving** • **reasoning** includes interpreting and evaluating media statements and interpreting and comparing data sets.	In Unit 8 students will be working mathematically within the following content and explore how the content is explored or developed. • **understanding** includes finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs • **fluency** includes factorising and expanding algebraic expressions, using a range of strategies to solve equations and using calculations to investigate the shape of data sets • **problem-solving** includes using algebraic and graphical techniques to find solutions • **reasoning** includes interpreting and comparing data sets
Assessment Tasks			
Summative Assessment Task 3: Assignment over 4 weeks Starting at the End of Term 2 and finishing in Term 3 Unit 5 **Approximately Due in Week 3 Term 3** **Semester Weighting: 20%** **Students will:** • Determine quartiles and interquartile range • Construct and interpret box plots and use them to compare data sets • Compare shapes of box plots to corresponding histograms and dot plots • Use scatter plots to investigate and comment on relationships between two numerical variables • Investigate and describe bivariate numerical data where the independent variable is time • Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data • Investigate reports of studies in digital media and elsewhere for information on their planning and implementation • Calculate and interpret the mean and standard deviation of data and use these to compare data sets • Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation	**Summative Assessment Task 4: 2 x 60 - 70 min** Test at the end of Unit 6 (assessing Unit 6 and elements from Unit 5 missed in the IA3) - **They describe bivariate data where the independent variable is time. Students describe statistical relationships between two continuous variables.** **Approximately Week 9 Term 3** **Semester Weighting: 40%** **Students will:** • Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids • Formulate proofs involving congruent triangles and angle properties • Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes • Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids • Prove and apply angle and chord properties of circles	**Students will:** • Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies • Substitute values into formulas to determine an unknown • Use the definition of a logarithm to establish and apply the laws of logarithms • Simplify algebraic products and quotients using index laws • Solve simple exponential equations	**Summative Assessment Task 5: 60 - 70 min** Test at the end of Unit 7 and 8 **Approximately Week 7 Term 4** **Semester Weighting: 40%** **Students will:** • Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation • Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate • Patterns and algebra • Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems • Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations