Erindale Sports Academy

Course Title	Mathematics (Advanced)	Course Code:
AC Mathematics 10A	Topic 4 – Trigonometry Topic 2 – Geometry Topic 8 – Probability Topic 9 – Statistics Topic 3 – Indices and Surds Topic 10 – Logarithms and Polynomials	0580

Content Summary:

- Formulate proofs involving congruent triangles and angle properties (ACMMG243)
- Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244)
- Prove and apply angle and chord properties of circles (ACMMG272)
- Solve simple trigonometric equations (ACMMG275)
- Solve right-angled triangle problems including those involving direction and angles of elevation and depression (ACMMG245)
- Establish the sine, cosine and area rules for any triangle and solve related problems (ACMMG273)
- Apply Pythagoras' Theorem and trigonometry to solving three-dimensional problems in right-angled triangles (ACMMG276)
- Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies (ACMMG274)
- Calculate and interpret the mean and standard deviation of data and use these to compare datasets (ACMSP278)
- Determine quartiles and interquartile range (ACMSP248)
- Construct and interpret box plots and use them to compare data sets (ACMSP249)
- Compare shapes of box plots to corresponding histograms and dot plots (ACMSP250)
- Use scatter plots to investigate and comment on relationships between two numerical variables(ACMSP251)
- Investigate and describe bivariate numerical data where the independent variable is time(ACMSP252)
- Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (ACMSP253)
- Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation (ACMSP279)
- 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 (ACMSP246)
- Use the language of 'if ....then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (ACMSP247)
- Investigate reports of studies in digital media and elsewhere for information on their planning and implementation (ACMSP277)
- Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (ACMNA229)
- Define rational and irrational numbers and perform operations with surds and fractional indices(ACMNA264)
- Use the definition of a logarithm to establish and apply the laws of logarithms (ACMNA265)
- Solve simple exponential equations (ACMNA270)
- Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (ACMNA266)
- Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (ACMNA268)

Outcomes:

Year 10.320	Recognises the connection between simple and compound interest
Year 10.325	Applies deductive reasoning to prrofs and numerical exercises involving plane shapes
Year 10.326	Compares data sets by referring to the shapes of the various data displays
Year 10.327	Describes bivariate data where the independent variable is time
Year 10.328	Describes statistical relationships between two continuous variables
Year 10.329	Evalutates statistical reports
Year 10.334	Uses triangle and angle properties to prove congruence and similarity
Year 10.335	Uses trigonometry to calculate unknown angles in right angled triangles
Year 10.336	Lists outcomes for multi-step chance experiments and assigns probabilityes for these experiments
Year 10.337	Calculates quartile and interquartile ranges
Year 10A.3505	Applies problem-solving skills and mathematical techniques to solve problems
Year 10A.3507	Communicates using mathematical language and conventions to justify solutions
Year 10A.3506	Applies the logarithm laws
Year 10A.3509	Makes the connections between algebraic and graphical represenations of polynomials
Year 10A.3510	Recognises the relationships between the unit circle and the trigonometric functions
Year 10A.3512	Solves exponential equations
Year 10A.3513	Solves problems involving fractional indices and surds
Year 10A.3514	Solves trigonometric equations
Year 10A.3515	Uses trigonometry to calculate unknown values in both righ-angled and non right-angled triangles
Year 10A.3516	Applies the factor and remainder theorems to solve problems

Cost of Materials:

NA

Assessment:

TASK	DUE DATE
Assignment	Week 7
Exam	Week 10
Exam	Week 17

Year 10 Achievement Standard:

By the end of Year 10, students recognise the connection between simple and compound interest. They solve problems involving linear equations and inequalities. They make the connections between algebraic and graphical representations of relations. Students solve surface area and volume problems relating to composite solids. They recognise the relationships between parallel and perpendicular lines. Students apply deductive reasoning to proofs and numerical exercises involving plane shapes. They compare data sets by referring to the shapes of the various data displays. They describe bivariate data where the independent variable is time. Students describe statistical relationships between two continuous variables. They evaluate statistical reports.

Students expand binomial expressions and factorise monic quadratic expressions. They find unknown values after substitution into formulas. They perform the four operations with simple algebraic fractions. Students solve simple quadratic equations and pairs of simultaneous equations. They use triangle and angle properties to prove congruence and similarity. Students use trigonometry to calculate unknown angles in right-angled triangles. Students list outcomes for multi-step chance experiments and assign probabilities for these experiments. They calculate quartiles and inter-quartile ranges.

ASSESSMENT CRITERIA FOR ASSESSMENT AND REPORTING OF STUDENT ACHIEVEMENT

The following assessment criteria are a focus for assessment and reporting in this unit. Criteria are the essential qualities that teachers look for in student work. These criteria must be used by teachers to assess student's performance, however not all of them need to be used on each task. Assessment criteria are to be used holistically on a given task and in determining the unit grade. Students will be assessed on the degree to which they demonstrate:

- **Knowledge** of mathematical facts, techniques and formulas presented in the unit;
- Appropriate selection and **application** of mathematical skills in mathematical modelling and problem solving;
- **Communication,** interpretation and presentation of mathematical ideas;
- The development of logical **arguments** to support solutions; and
- Appropriate use of **technology**.

Unit grades for Mathematics

The following A-E descriptors will appear on the report:
A demonstrating excellent achievement of what is expected
B demonstrating a high achievement of what is expected
C demonstrating satisfactory achievement of what is expected
D demonstrating partial achievement of what is expected
E demonstrating limited achievement of what is expected

UNIT GRADES   Students will be assessed on the degree to which they demonstrate:

	Knowledge	Application	Reasoning	Communication
A student who achieves the grade **A**	Demonstrates very high level of proficiency in the use of facts, techniques and formulae.	Selects, extends and applies appropriate modelling & problem-solving techniques.	Uses mathematical reasoning to develop logical arguments in support of conclusions, results and/or decisions; justifies procedures.	Is consistently accurate and appropriate in presentation of mathematical ideas in different contexts.
A student who achieves the grade **B**	Demonstrates high level of proficiency using facts, techniques & formulae.	Selects and applies appropriate modelling and problem-solving techniques.	Uses mathematical reasoning to develop logical arguments in support of conclusions, results and/or decisions.	Is generally accurate and appropriate in presentation of mathematical ideas in different contexts.
A student who achieves the grade **C**	Demonstrates some proficiency in the use of facts, techniques and formulae studied.	With direction, applies a model. Solves most problems.	Uses some mathematical reasoning to develop logical arguments.	Presents mathematical ideas in different contexts.
A student who achieves the grade **D**	Demonstrates limited use of the facts, techniques & formulae studied.	Solves some problems independently.	Uses some mathematical reasoning to develop simple logical arguments.	Presents some mathematical ideas.
A student who achieves the grade **E**	Demonstrates very limited use of the facts, techniques & formulae studied.	Solves some problems with guidance.	Uses limited reasoning to justify conclusions.	Presents some mathematical ideas with guidance.

Attendance and participation

Students are expected to submit all assessment items and attend all classes, participate in a positive manner and seek support whenever it is required. It is your responsibility to catch up on missed work when absent from class.

Late submission of work

Students are encouraged to submit work on time, as it is a valuable organisational skill. Students are encouraged to complete work even if it is late, as there are educational benefits in doing so. If you do not submit your work to your class teacher, make sure that it is signed and dated by either another member of staff in the faculty staffroom, or a member of the front office staff.

No work will be accepted after marked work has been returned, or accepted after the unit has completed. Computer and/or printer failure will not be accepted as a valid reason for late work. Make sure you backup, keep hard copies and rough notes.

Cheating and dishonest practice

The integrity of the College's assessment system relies upon all involved acting in accordance with the highest standards of honesty and fairness. Any departure from such standards will be viewed very seriously. Accordingly:

- Plagiarism - claiming authorship of someone else's work (intentionally or otherwise) - is a serious misdemeanour, and attracts severe penalties.
- Students are required to acknowledge the source of all material that is incorporated into their own work.
- Students may not submit the same item for assessment in more than one unit, unless specific agreement has been reached with the class teacher.

RIGHT TO APPEAL

You can appeal against your assessment if you feel that the result you obtained is not fair. You should first talk to your class teacher, and if you are not satisfied with the explanation you must discuss the situation with the Executive Teacher of the faculty concerned. If you still do not feel that your result is fair you should talk to the Deputy Principal Programs for further advice.

Executive Teacher: Jodie Beaumont