MATHEMATICS, SCIENCE AND INFORMATION TECHNOLOGY ACADEMY
UNIT OUTLINE

MATHEMATICS FACULTY

SEMESTER 1 2019

Course Title	**Year 10 IGCSE Mathematics**

Curriculum Content

- Factorise algebraic expressions by taking out a common algebraic factor (ACMNA230)
- Apply the four operations to simple algebraic fractions with numerical denominators (ACMNA232)
- Expand binomial products and factorise monic quadratic expressions using a variety of strategies(ACMNA233)
- Simplify algebraic products and quotients using index laws (ACMNA231)
- Substitute values into formulas to determine an unknown (ACMNA234)
- Solve problems involving linear equations, including those derived from formulas (ACMNA235)
- Solve linear equations involving simple algebraic fractions (ACMNA240)
- Solve linear inequalities and graph their solutions on a number line (ACMNA236)
- Solve linear simultaneous equations, using algebraic and graphical techniques, including using digital technology (ACMNA237)
- Solve simple quadratic equations using a range of strategies (ACMNA241)
- Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts (ACMNA269)
- Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (ACMNA267)
- Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239)
- Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids (ACMMG242)
- Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids (ACMMG271)
- Solve problems involving parallel and perpendicular lines (ACMNA238)

Subject levies and equipment

Students must bring an exercise book (lined, with or without a margin), writing equipment including pens (blue or black), HB pencil, ruler, and a scientific calculator. An additional 5mm grid book is useful for some topics.

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

TASK	DUE DATE
Exam 1	Week 8
Assignment	Week 12
Final Exam	Week 18

Assessment criteria 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 on the 'appeal process'.

Executive Teacher: Ruth Edge   **Class Teacher:** Natalie Keen
Date: 12th February 2019