



Year 10 Extension Mathematics

Recommendation

A High Achievement (B) in Year 9 Mathematics. An interview with the Mathematics teacher can be arranged to determine a student's ability to undertake Extension Mathematics.

Achievement

By the end of Year 10, students recognise the effect of approximations of real numbers in repeated calculations. They use mathematical modelling to solve problems involving growth and decay in financial and other applied situations, applying linear, quadratic and exponential functions as appropriate, and solve related equations, numerically and graphically. Students make and test conjectures involving functions and relations using digital tools. They solve problems involving simultaneous linear equations and linear inequalities in 2 variables graphically and justify solutions.

Students interpret and use logarithmic scales representing small or large quantities or change in applied contexts. They solve measurement problems involving surface area and volume of composite objects. Students apply Pythagoras' theorem and trigonometry to solve practical problems involving right-angled triangles. They identify the impact of measurement errors on the accuracy of results. Students use mathematical modelling to solve practical problems involving proportion and scaling, evaluating and modifying models, and reporting assumptions, methods and findings. They use deductive reasoning, theorems and algorithms to solve spatial problems. Students interpret networks used to represent practical situations and describe connectedness

They plan and conduct statistical investigations involving bivariate data. Students represent the distribution of data involving 2 variables, using tables and scatter plots, and comment on possible association. They analyse inferences and conclusions in the media, noting potential sources of bias. Students compare the distribution of continuous numerical data using various displays, and discuss distributions in terms of centre, spread, shape and outliers. They apply conditional probability to solve problems involving compound events. Students design and conduct simulations involving conditional probability, using digital tools.

Assessment Criteria

Using the marking guide provided, an overall level of achievement in this subject is determined by the teacher's judgment of the evidence presented in students' summative assessment. All assessment unless noted on task sheet completed by Maths students assess the following criteria:

- Understanding and fluency
- Problem-solving and reasoning

Delivery (mode, time requirements, lessons)

Each week, students participate in three one-hour live lessons conducted through Microsoft Teams. Successful students complete the lesson activities lessons live or later at a suitable time. In addition to these sessions, they are expected to engage in independent study to complete tasks and assessments aligned with the Work Rate Calendar. All course materials are available via the learning management system (QLearn).

Student Requirements

Computer, access to internet, email, printer, scanner, headset with microphone, audio visual software/devices, scientific calculator, exercise book, stationery.

Year 10 Extension Mathematics (Semester 1)

Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of Summative Assessment	
Semester 1	Term 1
	<p>Unit 1 Pythagoras and Trigonometry Use Pythagoras' theorem and trigonometry of right-angled triangles to solve spatial problems in two- and three-dimensions; and manipulate images of their representations using digital tools</p> <p>Chance investigate conditional probability and its relation to dependent and independent events, including sampling with and without replacement; devise and use simulations to test intuitions involving chance events that may or may not be independent</p>
	<p>Summative Assessment, due date:</p> <ul style="list-style-type: none"> • Short answer questions (Week 9)
	Term 2
	<p>Unit 2 Linear and non-linear relationships Explore connections between algebraic and graphical representations, make generalisations in relation to parallel and perpendicular lines, identify the solution to two intersecting linear equations, apply graphical and substitution methods to find solutions and solve contextualised problems. Explore linear inequalities</p> <p>Patterns and algebra Apply the four operations to algebraic fractions, manipulate expressions & equations to solve problems involving algebraic fractions, formulate & solve problems involving algebraic fractions, expand brackets, and apply the index laws</p> <p>SA and Volume solve measurement problems involving the surface area and volume of common objects, composite objects and irregular objects</p>
	<p>Summative Assessment, due date:</p> <ul style="list-style-type: none"> • Short answer questions (Week 9)

Year 10 Extension Mathematics (Semester 2)

Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of Summative Assessment	
Semester 2	Term 3
	<p>Unit 3 Data representation and interpretation compare different ways of representing the distribution of continuous data and interpret key features of the distribution; explore association between pairs of variables, decide the form of representation, interpret the data with respect to the context and discuss possible conclusions; use scatterplots to informally discuss and consider association between 2 numerical variables and informally consider lines of good fit by eye, interpolation, extrapolation and limitations.</p> <p>Geometric reasoning apply geometric theorems to deduce results and solve problems involving plane shapes,</p> <p>Networks interpret networks and network diagrams in authentic contexts, manipulate images of their representations using digital tools.</p>
	<p>Summative Assessment, criteria assessed, approximate timing/due date:</p> <ul style="list-style-type: none"> • Assignment (Week 5) – Data Representation and Interpretation • Short answer questions (Week 10)
	Term 4
	<p>Unit 4 Quadratic and Exponential Functions generalise and extend their repertoire of algebraic techniques involving quadratic and exponential algebraic expressions use mathematical modelling to solve problems in applied situations exhibiting growth or decay using linear, quadratic and exponential functions; and solve related equations, numerically, graphically and algebraically, with the use of digital tools as applicable. Explore indices and surds.</p>
	<p>Summative Assessment, criteria assessed, approximate timing/due date:</p> <ul style="list-style-type: none"> • Short answer questions (Week 6)

Disclaimer All of the above information is accurate at the time of development.