Year 9 Mathematics

Achievement

By the end of Year 9, students recognise and use rational and irrational numbers to solve problems. They extend and apply the exponent laws with positive integers to variables. Students expand binomial products and factorise monic quadratic expressions. They find the distance between 2 points on the Cartesian plane, and the gradient and midpoint of a line segment. Students use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions. They graph quadratic functions and solve monic quadratic equations with integer roots algebraically. Students describe the effects of variation of parameters on functions and relations, using digital tools, and make connections between their graphical and algebraic representations.

They apply formulas to solve problems involving the surface area and volume of right prisms and cylinders. Students solve problems involving ratio, similarity and scale in two-dimensional situations. They determine percentage errors in measurements. Students apply Pythagoras' theorem and use trigonometric ratios to solve problems involving right-angled triangles. They use mathematical modelling to solve practical problems involving direct proportion, ratio and scale, evaluating the model and communicating their methods and findings. Students express small and large numbers in scientific notation. They apply the enlargement transformation to images of shapes and objects and interpret results. Students design, use and test algorithms based on geometric constructions or theorems.

They compare and analyse the distributions of multiple numerical data sets, choose representations, describe features of these data sets using summary statistics and the shape of distributions, and consider the effect of outliers. Students explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view. They determine sets of outcomes for compound events and represent these in various ways. Students assign probabilities to the outcomes of compound events. They design and conduct experiments or simulations for combined events 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 Math's 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. 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

Student Requirements

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

Year 9 Mathematics (Semester 1)

Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of Summative Assessment		
Semester 1	Term 1	**Unit 1A** **Using units of measurement** Calculate the surface area and volume of right prisms, cylinders and composite shapes apply reasoning for real objects collected by the students. Calculate and interpret absolute, relative and percentage errors in measurements, recognising that all measurements are estimates
		Unit 1B **Algorithms, Ratio & Scale** Design, use and test algorithms based on geometric constructions or theorems. Apply the enlargement transformation to images of shapes and objects and interpret results. Solve problems involving ratio, similarity and scale in two-dimensional situations. Use mathematical modelling to solve practical problems involving direct proportion, ratio and scale, evaluating the model and communicating their methods and findings.
		Summative Assessment, due date: • Assignment Unit 1A (Week 5) • Supervised Exam Unit 1B (Week 9)
	Term 2	**Unit 2A** **Pythagoras & Trigonometry** Apply Pythagoras' Theorem to check if a triangle is acute, right or obtuse, determine unknown side lengths of right-angled triangles, solve problems involving right-angled triangles, apply naming conventions for sides of right-angled triangles, use similarity to investigate the constancy of the sin, cos and tan ratios, investigate patterns in trigonometric ratios, calculate trigonometric ratios using known angle or side length values, calculate unknown side lengths in right-angled triangles, solve problems using trigonometry, and calculate unknown angles in right-angled triangles.
		Unit 2B **Linear Functions** Use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear functions. Describe the effects of variation of parameters on functions and relations, using digital tools, and make connections between their graphical and algebraic representations.
		Summative Assessment, due date: • Supervised Exam Unit 2A (Week 5) • Supervised Exam Unit 2B (Week 9)

Year 9 Mathematics (Semester 2)

Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of Summative Assessment		
Semester 2	Term 3	**Unit 3A** **Quadratic Functions** Expand binomial products and factorise monic quadratic expressions. Graph quadratic functions and solve monic quadratic equations with integer roots algebraically. Use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions.
		Unit 3B **Statistics** Compare and analyse the distributions of multiple numerical data sets, choose representations, describe features of these data sets using summary statistics and the shape of distributions, and consider the effect of outliers. Explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view.
		Summative Assessment, due date: • Assignment Unit 3A (Week 5) • Supervised Exam Unit 3B (Week 9)
	Term 4	**Unit 4A** **Probability** Determine sets of outcomes for compound events and represent these in various ways. Assign probabilities to the outcomes of compound events. Design and conduct experiments or simulations for combined events using digital tools.
		Unit 4B **Indices and Scientific Notation** Express numbers using scientific notation and perform operations using index laws. Extend and apply the exponent laws with positive integers to variables. Express small and large numbers in scientific notation.
		Summative Assessment, due date: • Supervised Exam Unit 4A (Week 4) • Supervised Exam Unit 4B (Week 8)

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