

Level description: Year 10

In Year 10, learning in Mathematics builds on each student's prior learning and experiences. Students engage in a range of approaches to learning and doing mathematics that develop their understanding of and fluency with concepts, procedures and processes by making connections, reasoning, problem-solving and practice. Proficiency in mathematics enables students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently. Students further develop proficiency and positive dispositions towards mathematics and its use as they:

- **investigate the accuracy of decimal approximations to irrational real numbers ; consider the accuracy of computation with real numbers in context and the use of logarithmic scales to deal with phenomena involving small and large quantities and change**
- **apply numerical, graphical and algebraic approaches to analyse the behaviour of pairs of linear equations and linear inequalities in 2 variables**
- **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**
- **solve measurement problems involving the surface area and volume of common objects , composite objects and irregular objects ; 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**
- **apply geometric theorems to deduce results and solve problems involving plane shapes , and interpret networks and network diagrams in authentic contexts**
- **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**
- **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.**

Achievement standard: Year 10

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.