Year 10 Syllabus

Year Level Description

The proficiency strands **understanding, fluency, problem-solving** and **reasoning** are an integral part of mathematics content across the three content strands: number and algebra, measurement and geometry, and statistics and probability. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics. The achievement standards reflect the content and encompass the proficiencies.

At this year level:

- **understanding** includes applying the four operations to algebraic fractions, finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs, comparing simple and compound interest in financial contexts and determining probabilities of two- and three-step experiments
- **fluency** includes factorising and expanding algebraic expressions, using a range of strategies to solve equations and using calculations to investigate the shape of data sets
- **problem-solving** includes calculating the surface area and volume of a diverse range of prisms to solve practical problems, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities and investigating independence of events
- **reasoning** includes formulating geometric proofs involving congruence

and similarity, interpreting and evaluating media statements and interpreting and comparing data sets.

Number and Algebra

MONEY AND FINANCIAL MATHEMATICS

Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (ACMNA229)

Numeracy

Information and Communication Technology (ICT) capability

PATTERNS AND ALGEBRA

Factorise algebraic expressions by taking out a common algebraic factor

Measurement and Geometry

USING UNITS OF MEASUREMENT

Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids (ACMMG242)

Literacy

Numeracy

GEOMETRIC REASONING

Formulate proofs involving congruent triangles and angle properties (ACMMG243)

Numeracy

Apply logical

Statistics and Probability

CHANCE

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)

Literacy

Numeracy

Critical and creative thinking

Use the language of 'if ....then', 'given', 'of', 'knowing that' to

(ACMNA230)

Numeracy

Simplify algebraic products and quotients using index laws (ACMNA231)

Numeracy

Apply the four operations to simple algebraic fractions with numerical denominators (ACMNA232)

Numeracy

Critical and creative thinking

Expand binomial products and factorise monic quadratic expressions using a variety of strategies (ACMNA233)

Numeracy

Substitute values into formulas to determine

reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244)

Numeracy

PYTHAGORAS AND TRIGONOMETRY

Solve right-angled triangle problems including those involving direction and angles of elevation and depression (ACMMG245)

Literacy

Numeracy

investigate conditional statements and identify common mistakes in interpreting such language (ACMSP247)

Literacy

Numeracy

DATA REPRESENTATION AND INTERPRETATION

Determine quartiles and interquartile range (ACMSP248)

Construct and interpret box plots and use them to compare data sets (ACMSP249)

Literacy

Numeracy

Compare shapes of box plots to corresponding histograms and dot plots (ACMSP250)

Literacy

an unknown (ACMNA234)

Numeracy

LINEAR AND NON-LINEAR RELATIONSHIPS

Solve problems involving linear equations, including those derived from formulas (ACMNA235)

Numeracy

Solve linear inequalities and graph their solutions on a number line (ACMNA236)

Numeracy

Solve linear simultaneous equations, using algebraic and graphical techniques, including using digital technology (ACMNA237)

Numeracy

Critical and creative thinking

Use scatter plots to investigate and comment on relationships between two numerical variables (ACMSP251)

Literacy

Numeracy

Critical and creative thinking

Investigate and describe bivariate numerical data where the independent variable is time (ACMSP252)

Literacy

Numeracy

Critical and creative thinking

Evaluate statistical reports in the media and other places by

Numeracy

Information and Communication Technology (ICT) capability

Solve problems involving parallel and perpendicular lines (ACMNA238)

Literacy

Numeracy

Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239)

Literacy

Numeracy

Information and Communication

linking claims to displays, statistics and representative data (ACMSP253)

Literacy

Numeracy

Critical and creative thinking

Ethical understanding

Technology (ICT) capability

Solve linear equations involving simple algebraic fractions (ACMNA240)

Numeracy

Solve simple quadratic equations using a range of strategies (ACMNA241)

Numeracy

Critical and creative thinking

Year 10 Achievement Standard

Number and Algebra

At Standard, students recognise the connection between simple and compound interest. They solve problems involving linear equations and inequalities. Students make the connections between algebraic and graphical representations of relations. They expand binomial expressions and factorise monic quadratic expressions. Students 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.

Measurement and Geometry

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 use triangle and angle properties to prove congruence and similarity. Students use trigonometry to calculate unknown angles in right-angled triangles.

Statistics and Probability

Students 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 list outcomes for multi-step chance experiments and assign probabilities for these experiments. They calculate quartiles and inter-quartile ranges.

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- **problem-solving** includes calculating the surface area and volume of a diverse range of prisms to solve practical problems, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities and investigating independence of events
- **reasoning** includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets.