

# Mathematics

Year 7 - 10 Mathematics

Mathematical Methods

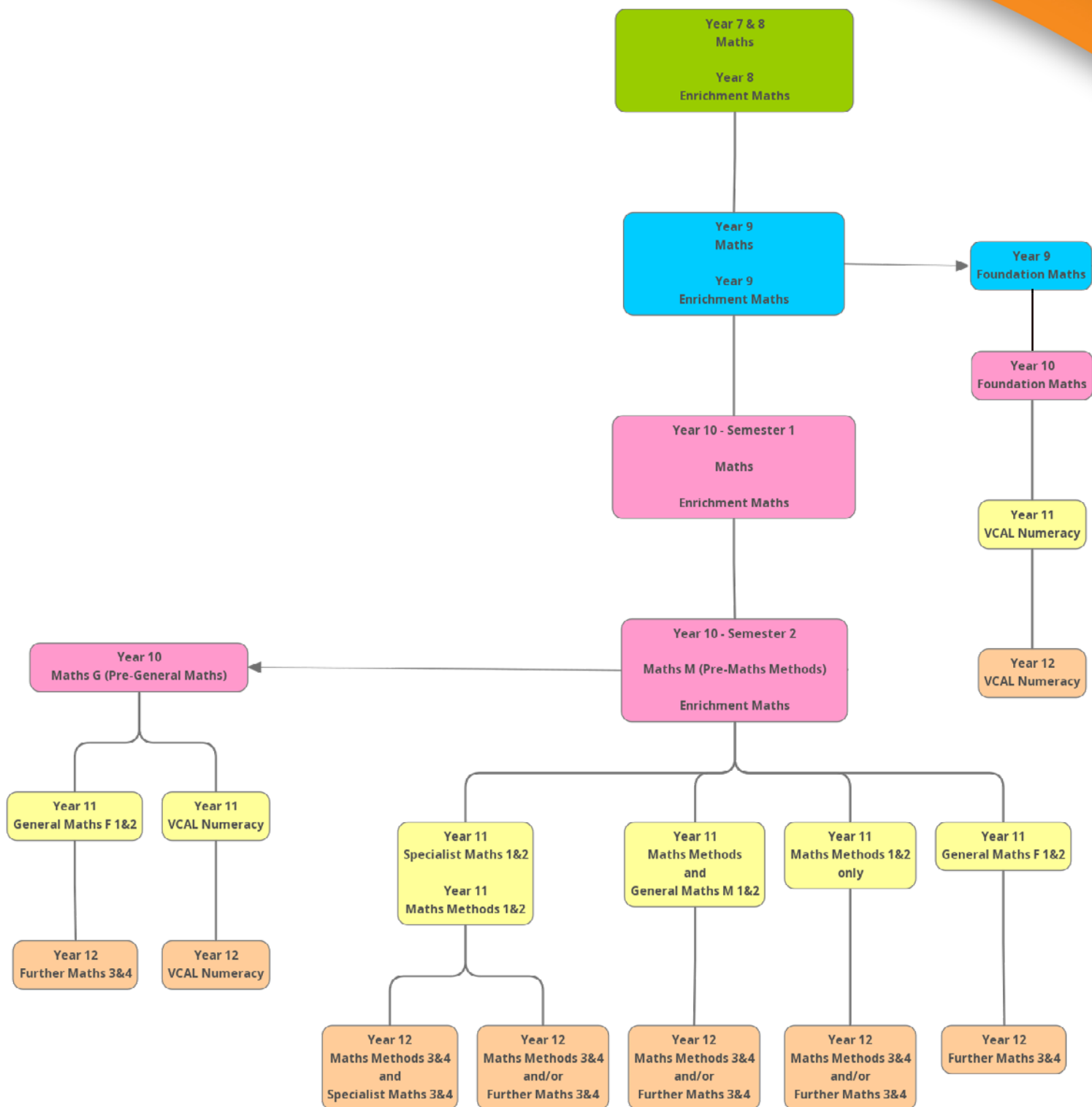
General Mathematics

Specialist Mathematics

Further Mathematics



# Mathematics Pathways



# Mathematics

## Year 7 - 8

Mathematics at Penola Catholic College provides access to worthwhile and challenging Mathematical learning in a way that considers the needs and aspirations of a wide range of students. It is designed to promote student awareness of the importance of Mathematics in everyday life in an increasingly technological society and confidence in making effective use of their mathematical knowledge and skills.

The purpose of each Mathematics unit is to consolidate basic mathematical skills and further develop these to confidently approach more complex mathematics and problem-solving activities and hence develop confidence in applying such techniques to the real world.

### Year 7 Mathematics - Semester 1 Topics:

- Whole Numbers
- Number Properties
- Measurement
- Geometry and Polygons

### Year 7 Mathematics - Semester 2 Topics:

- Fractions and Percentages
- Decimals
- Algebra
- Equations

### Year 8 Mathematics - Semester 1 Topics:

- Integers
- Measurement
- Fractions, Decimals and Percentages
- Ratios and Rates

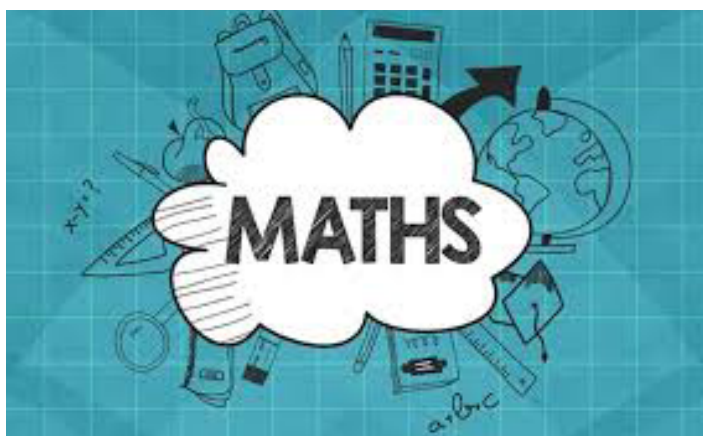
### Year 8 Mathematics - Semester 2 Topics:

- Algebra
- Equations
- Straight Line Graphs
- Probability and Statistics

### Year 8 Enrichment Mathematics

Enrichment Mathematics covers the same topics as mainstream Mathematics, but students are given the opportunity to maximize their learning potential by attempting more challenging problems and tasks that explore new, different and more complex Mathematical concepts.

Students will be invited each semester to be part of this program.



# Mathematics

## Year 9

Each semester students in Year 9 will study one of the following units:

- Year 9 Mathematics
- Year 9 Enrichment Mathematics
- Year 9 Foundation Mathematics

The purpose of each unit is to:

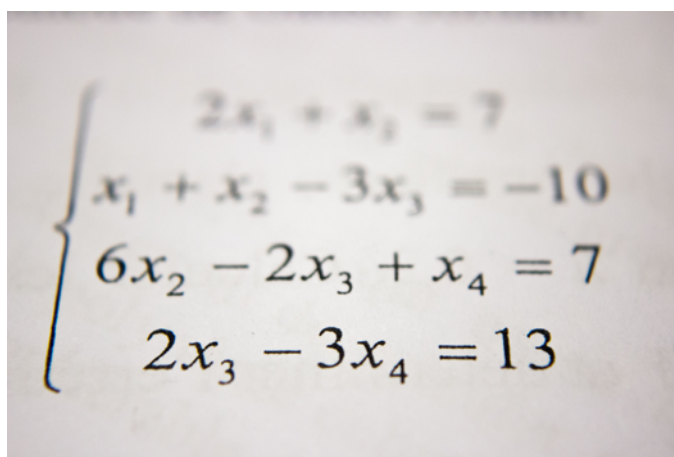
- Develop students' knowledge and skills in the topics listed
- Consolidate and extend on students' knowledge and skills from previous year's topic
- Develop students' skills to confidently approach more complex mathematics, problem-solving activities and investigative projects
- Enable students to apply relevant techniques to the real world

**Year 9 Mathematics - Semester 1 Topics:**

- Pythagoras
- Algebra
- Probability and Statistics
- Measurement

**Year 9 Mathematics - Semester 2 Topics:**

- Linear Relations
- Trigonometry
- Financial Maths
- Geometry


$$\left\{ \begin{array}{l} 2x_1 + x_2 = 7 \\ x_1 + x_2 - 3x_3 = -10 \\ 6x_2 - 2x_3 + x_4 = 7 \\ 2x_3 - 3x_4 = 13 \end{array} \right.$$

**Year 9 Enrichment Mathematics**

Enrichment Mathematics covers the same topics as mainstream Mathematics, but students are given the opportunity to maximize their learning potential by attempting more challenging problems and tasks that explore new, different and more complex Mathematical concepts.

Students will be invited each semester to be part of this program.

**Year 9 Foundation Mathematics**

Foundation Mathematics is a practical study of Mathematics in the real world. It is designed for those students who have experienced difficulty in their study of Mathematics. Classes in this subject are limited to 15 students to increase teacher access time for students.

These students will not continue to study Mathematics at the VCE level.

Students will be invited to join the Year 9 Foundation Maths class by teachers in consultation with the Assistant Head of Mathematics, Student Services and parents/guardians.

### Semester 1 Topics

- Working with numbers
- Measurement 1
- Shapes and Angles
- Statistics

### Semester 2 Topics

- Measurement 2
- Financial Maths
- Pythagoras
- Trigonometry

# Mathematics

## Year 10

In Semester One students will study one of the following:

- Year 10 Mathematics
- Year 10 Enrichment Mathematics
- Year 10 Foundation Mathematics

In Semester Two students will study one of the following:

- Year 10 Mathematics M (pre-Methods)
- Year 10 Mathematics G (pre-General)
- Year 10 Enrichment Mathematics (pre-Methods)
- Year 10 Foundation Mathematics

Year 10 Mathematics

The mainstream study of Mathematics enables students to choose any of the available options in the study of Mathematics offered at Penola Catholic College at Year 11. It is expected that most students will complete this option.

**Semester 1 Topics:**

- Measurement
- Algebra
- Linear Relations
- Trigonometry

**Semester 2 Pathways**

At the end of Semester 1, based on their semester 1 results, students will be nominated by their Maths teacher for either 10 Maths M or 10 Maths G.

**10 Maths M** is designed to prepare students for Year 11 Maths Methods.

**10 Maths G** is designed to prepare students for Year 11 General Maths F.

**Semester 2 Topics**

**Year 10 M:**

- Quadratic Functions
- Probability
- Surds and Indices
- Advanced Algebra

**Year 10 G:**

- Statistics 1
- Consumer Maths
- Statistics 2
- Geometry and Trigonometry



## Year 10 Foundation Mathematics

Foundation Mathematics is a practical study of Mathematics in the real world. It is designed for those students who have experienced difficulty in their study of Mathematics. Classes in this subject are limited to 15 students to increase teacher access time for students.

These students will not continue to study Mathematics at the VCE level.

Students will be invited to join this class by Year 9 Maths teachers in consultation with the Head of Mathematics, Student Services and the student's parents/guardians.

### Semester 1 Topics:

- Measurement 1
- Consumer Maths 1
- Geometry
- Probability

### Semester 2 Topics:

- Measurement 2
- Consumer Maths 2
- Using Data
- Trigonometry



# VCE Mathematics

## Mathematical Methods Units 1 and 2

These units are designed to prepare students for Maths Methods 3 & 4 and later for tertiary studies including most Science or Economics Courses.

Although it is possible to prepare for Maths Methods 3 & 4 by studying only Maths Methods Units 1 & 2, a much firmer basis for study is obtained by also studying General Mathematics.

Studying Maths Methods Units 1 & 2 only in Year 11 is not normally recommended but may be suitable for students who have achieved an average B grade in Year 10 Mathematics and who have space for only one Mathematics subject in their Year 11 course.

### Unit 1 Topics:

- Quadratic Functions
- Probability
- Cubic and Quartic functions
- Rates of Change

### Unit 2 Topics:

- Logarithmic and Exponential Functions
- Calculus
- Circular functions
- Advanced functions

## Mathematical Methods Units 3 and 4

These units follow on directly from Mathematical Methods 1 & 2. They are intended to provide a suitable foundation for tertiary studies including most Science and some Commerce courses.

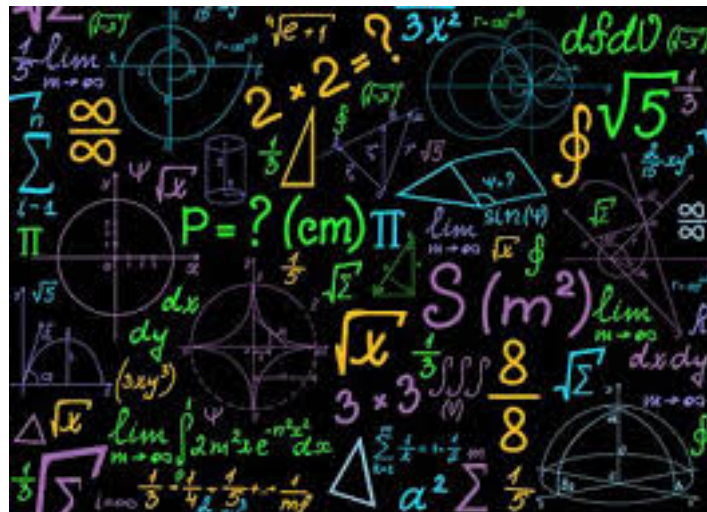
Students may take these units on their own or with either Further Mathematics 3 & 4 or Specialist Mathematics 3 & 4.

### Unit 3 Topics:

- Polynomial Functions
- Exponential and Logarithmic Functions
- Circular Functions
- Transformations of functions
- Differentiation
- Applications of Differentiation

### Unit 4 Topics:

- Integral Calculus
- Discrete Random Variables
- Continuous Random Variables
- Sampling and Estimation



### General Mathematics (M) Units 1 and 2

These units must be taken in conjunction with Maths Methods 1 & 2.

Together with Maths Methods 1 & 2, they are designed to prepare students for Maths Methods 3 & 4 and/or for Further Maths 3 & 4.

#### Unit 1 Topics:

- Linear Equations
- Data Distributions
- Measurement
- Linear Graphs

#### Unit 2 Topics:

- Matrices
- Trigonometry
- Data Relationships
- Number Patterns and Recursion

### General Mathematics (F) Units 1 and 2

These units are designed as preparation for Further Maths 3 & 4 and later for some Tertiary or TAFE courses (generally non-science studies) and to prepare students for employment.

#### Unit 1 Topics:

- Measurement
- Arithmetic Techniques
- Data Distributions
- Financial Maths

#### Unit 2 Topics:

- Trigonometry
- Data Relationships
- Matrices
- Number Patterns and Recursion

### Further Mathematics Units 3 and 4

These units are designed to follow on directly from General Mathematics 1 & 2. They are intended to provide a broad base of Mathematical experience which is considered suitable for employment or tertiary studies where mathematics is a supporting subject but not the main focus of the course.

Students may take these units on their own or with Mathematical Methods 3 & 4.

#### Unit 3 Topics

- Core: Data Distributions
- Core: Data Relationships
- Core: Time Series Data
- Core: Recursion and Financial Modelling

#### Unit 4 Topics

- Module: Matrices
- Module: Geometry and Measurements

### Specialist Mathematics Units 1 and 2

These units must be taken in conjunction with Maths Methods 1 & 2.

Together with Maths Methods 1 & 2 they are designed to prepare students for all Year 12 Maths, in particular, Maths Methods 3 & 4 and Specialist Maths 3 & 4, and later for tertiary studies including Mathematics and Engineering.

#### Unit 1 Topics

- Algebra Techniques
- Applications of Trigonometry
- Complex Numbers
- Vectors

#### Unit 2 Topics

- Graphing Techniques
- Kinematics and Statics
- Advanced Algebra
- Further Trigonometry



## Specialist Mathematics Units 3 and 4

These units are designed to prepare students for tertiary courses in Mathematics and Engineering.

Students must take these units in conjunction with Mathematical Methods 3 & 4.

### Unit 3 Topics

- Vectors
- Complex Numbers
- Circular Functions
- Sketch Graphs
- Techniques of Integration
- Applications of Integration

### Unit 4 Topics

- Differential Equations
- Kinematics
- Vector Calculus
- Dynamics
- Sampling

