

# Mathematics 12

## Course Syllabus



Mathematics 12 is an asynchronous, self-paced course. This means you can take the course wherever you want, at any time of day, and go at your own speed.

### Meet with Mentor

You will be required to meet online with your mentor no fewer than 9 times, for 30 minutes each time. As follows:

#### Unit 1:

- Early/mid-point in each unit  
*(following lesson 1.3 is recommended)*
- Before you write each end of unit assessment

#### Unit 2:

- Early/mid-point in each unit  
*(following lesson 2.3 is recommended)*
- Before you write each end of unit assessment

#### Unit 3:

- Early/mid-point in each unit  
*(following lesson 3.3 is recommended)*
- Before you write each end of unit assessment

#### Unit 4:

- Early/mid-point in each unit  
*(following lesson 4.3 is recommended)*
- Before you write each end of unit assessment
- Before you write the final exam

### Time Requirement

You have 18 months to complete the course work and write all assessments.

You should expect to dedicate 60 hours to this course, plus study time. For example, if you want to complete this course in a semester, you should spend at least 3 hours per week.

You will need to factor your mentor's availability into planning your timeline, as they may or may not be able to meet with you if you make a last-minute request. Remember to be respectful when arranging meetings.

### Technical Requirements

A PC, laptop or Chromebook (a phone can be used, but may be less than ideal).

Phone or camera to photograph/scan work, which can then be uploaded into the LMS (Moodle).

An internet connection.

Optional: physical graphing calculator, ex. TI-84+. An online calculator is available through the course.

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## Course Assessment

### Course Outline

Your course grade will be based on the following breakdown:

**Unit 1: 30%**

**Unit 2: 15%**

**Unit 3: 20%**

**Unit 4: 15%**

**Final Exam: 20%**

### Unit 1 Lessons:

- 1.1 Introduction to Relations and Functions
- 1.2 Graphs and Equations of Polynomial Functions
- 1.3 Polynomial Functions Review
- 1.4 Modelling Data: Lines of Best Fit
- 1.5 Modelling Data: Curves of Best Fit
- 1.6 Introduction to Exponential Functions
- 1.7 Modelling Data Using Exponential Functions
- 1.8 Introduction to Logarithmic Functions
- 1.9 Modelling Data Using Logarithmic Functions
- 1.10 Working with Sinusoidal Functions
- 1.11 Understanding Angles
- 1.12 Introduction to Periodic Functions

### Unit 2 Lessons:

- 2.1 Introduction to Simple Interest
- 2.2 Compound Interest: Future Value and Present Value
- 2.3 Investment Portfolios
- 2.4 Loans
- 2.5 Credit Cards
- 2.6 Buy, Rent, or Lease

### Unit 3 Lessons:

- 3.1 Introduction to Set Theory
- 3.2 Types of Sets and Set Notation
- 3.3 Exploring Relationships Between Sets
- 3.4 Mathematics Games and Puzzles Part 1
- 3.5 Intersection and Union of Two Sets
- 3.6 Mathematics Games and Puzzles Part 2
- 3.7 Applications of Set Theory
- 3.8 Mathematics Games and Puzzles Part 3

### Unit 4 Lessons:

- 4.1 Introduction to the Fundamental Counting Principle
- 4.2 Permutations and Factorial Notation
- 4.3 Permutations when Objects are Distinguishable
- 4.4 Permutations when Objects are Identical
- 4.5 Introducing Combinations
- 4.6 Solving Counting Problems
- 4.7 Exploring Probability
- 4.8 Conditional Probability and Independent Events