

Mathematics Extension 1 – online materials

Please feel welcome to use our online materials, which are set out in days for you to study.

Each day consists of audiovisual modules (YouTube videos) on a number of mathematical topics for you to play and study. These modules are supplemented by notes, and a booklet of exercises for you to work through.

[Download the exercise booklet \(pdf, 303KB\).](#)

Day 1: Functions I

Audiovisual modules

- [Module 1.1](#) Functions, domain and range
- [Module 1.2](#) Sums, products and composition of functions
- [Module 1.3](#) Rules for differentiation

Additional materials

- [Functions: the domain and range \(pdf, 119KB\)](#)
- [The rules of calculus \(pdf, 89KB\)](#)

Day 2: Function II

Audiovisual modules

- [Module 2.1](#) The chain rule
- [Module 2.2](#) Implicit differentiation
- [Module 2.3](#) Related rates
- [Module 2.4](#) Parametric equations

Additional materials

- [Composite function rule \(the chain rule\) \(pdf, 88KB\)](#)

Day 3: Trigonometric identities

Audiovisual modules

- [Module 3.1](#) Revision
- [Module 3.2](#) Addition and subtraction laws and the double angle formulas
- [Module 3.3](#) t - substitution and sums of sine and cosine terms

Additional materials

- [Introduction to trigonometric functions \(pdf, 2.3MB\)](#)
- [Trigonometric identities \(pdf, 668KB\)](#)

Day 4: Mathematical induction

Audiovisual modules

- [Module 4.1](#) The method
- [Module 4.2](#) Examples and practice questions

Additional materials

- [Mathematical induction \(pdf, 153KB\)](#)

Day 5: Polynomials and rational functions

Audiovisual modules

- [Module 5.1](#) Polynomials
- [Module 5.2](#) Finding roots and the Remainder Theorem
- [Module 5.3](#) Rational functions

Additional materials

- [Polynomials \(pdf, 110KB\)](#)

Day 6: Solving equations

Audiovisual modules

- [Module 6.1](#) Solving quadratic and cubic equations
- [Module 6.2](#) Trigonometric equations
- [Module 6.3](#) Solving inequalities

Additional materials

- [Absolute values \(pdf, 83KB\)](#)
- [Solving inequalities \(pdf, 125KB\)](#)

Day 7: Integration techniques

Audiovisual modules

- [Module 7.1](#) Integration by substitution
- [Module 7.2](#) Substitution and definite integrals
- [Module 7.3](#) The integration of $\sin^2 x$ and $\cos^2 x$

Additional materials

- [Introduction to integration part 1: the anti-derivative \(pdf, 191KB\)](#)
- [Introduction to integration part 2: the definite integral \(pdf, 281KB\)](#)

Day 8: Inverse functions

Audiovisual modules

- [Module 8.1](#) Introducing inverse functions
- [Module 8.2](#) Finding inverse functions
- [Module 8.3](#) Inverse trigonometric functions

Day 9: Applications of calculus

Audiovisual modules

- [Module 9.1](#) Differential equations
- [Module 9.2](#) Simple harmonic motion

Day 10: Counting and permutations

Audiovisual modules

- [Module 10.1](#) Counting principles
- [Module 10.2](#) Permutations
- [Module 10.3](#) Permutations II

Additional materials

- [Counting techniques \(pdf, 1.9MB\)](#) up to page 6

Day 11: Combinations and the Binomial theorem

Audiovisual modules

- [Module 11.1](#) Combinations
- [Module 11.2](#) The Binomial Theorem

Additional materials

- [Counting techniques \(pdf, 1.9MB\)](#) from page 6

Day 12:

Revision – there are no new modules