



Pre-Calculus

- Section 1 – Functions
- Section 2 – Graphs of Functions
- Section 3 – Composite and Inverse Functions
- Section 4 – Linear & Quadratic Equations
- Section 5 – Polynomials
- Section 6 – Exponential & Logarithmic Functions
- Section 7 – Trigonometric Functions
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- Section 9 – Polar Co-ordinates
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- Section 11 – Series
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Section 1 – Functions

- What are Functions?
- Types of Function
- Maximum and Minimum Values of a Function
- Domain and Range of a Function
- Writing the Domain and Range of a Function
- Average Rate of Change of a Function

Section 2 – Graphs of Functions

- Graphs of Common Functions
- Sketching Graphs of Functions
- Sketching Graphs of Functions . . . More Advanced
- Behaviour of Functions

Section 3 – Composite and Inverse Functions

- Determining Inverse Functions
- The Graph of an Inverse Function
- The Domain & Range of an Inverse Function
- Determining Composite Functions



The Domain & Range of a Composite Function
Composite and Inverse Functions Together

Section 4 – Linear & Quadratic Equations

Solving Linear Equations
Solving Equations with Parentheses
Solving Equations with Fractions

Section 5 – Polynomials

Polynomial Expressions
Factorising Polynomial Expressions
Factorising Polynomial Expressions with a Given Factor
Factorising Polynomial Expressions without a Given Factor
Starting Polynomial Equations
Solving Polynomial Equations Already Factorised
Solving Polynomial Equations Not Factorised

Section 6 – Exponential & Logarithmic Functions

Exponential Expressions
Exponential Functions
Graphs of Exponential Functions
Logarithmic Expressions
Logarithmic Functions
Graphs of Logarithmic Functions
Switching Between Exponential & Logarithmic Form
Rules (Laws) of Logarithms

Section 7 – Trigonometric Functions

Starting Radians
Using Radians
The Unit Circle Definitions of the Trig Functions
The Graph of the Sine Function
The Graph of the Cosine Function
The Graph of the Tangent Function



Section 8 – Trigonometric Identities

The Double Angle Formulas

The Addition Formulas

The Wave Function

Section 9 – Polar Co-ordinates

What are Polar Co-ordinates?

Converting Between Polar & Cartesian Co-ordinates

Sketching Curves Given in Polar Form

Further Curve Sketching in Polar Form

Section 10 – The Binomial Expansion

Pascal's Triangle

Factorial Notation and Combinatorics

Binomial Expansion Using Factorial Notation

Binomial Expansion for $(1 + x)^n$

Section 11 – Series

From Sequences to Series

Arithmetic Sequences

Arithmetic Series

Geometric Sequences

Geometric Series

Sums to Infinity

Summation (Sigma) Notation

Section 12 – Proof by Induction

What is a Mathematical Proof?

Starting Proof by Induction

Proving Theorems by Induction