

UNIT 1 & 2 MATHEMATICAL METHODS

Mathematical Methods Units 1 and 2 provide an introductory study of simple elementary functions of a single real variable, algebra, calculus, probability and statistics and their applications in a variety of practical and theoretical contexts.

UNIT 1

In this unit students will cover the graphical representation of polynomial functions and their key features such as axis intercepts, domain and range, stationary points, asymptotic behavior and symmetry. Their behavior will be explored in a variety of contexts and theoretical investigations. There is a focus on the algebra of polynomial functions and transformations. The concepts of event, frequency, probability and finite sample spaces and events using various forms will be covered including complementary, mutually exclusive, conditional and independent events. Students will cover constant and average rates of change and an introduction to instantaneous rate of change of a function in familiar contexts.

AREA OF STUDY

- Functions, relations and graphs
- Algebra, number and structure
- Calculus
- Data analysis, probability and statistics

OUTCOMES

Outcome 1: Define and explain key concepts as specified in the content from the areas of study and apply a range of related mathematical routines and procedures.

Outcome 2: Apply mathematical processes in non-routine contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.

Outcome 3: Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in situations requiring investigative, modelling or problem-solving techniques or approaches.

UNIT 2

In this unit students will cover the graphical representation of functions and the key features of graphs of sine, cosine, tangent, exponential and logarithmic functions such as axis intercepts, domain, co-domain and range, asymptotic behavior, periodicity and symmetry. There is a focus on the algebra of some simple transcendental functions and transformations of the plane. Students will cover first principles approach to differentiation, differentiation and anti-differentiation of polynomial functions and power functions by rule, and related applications including the analysis of graphs. Introductory counting principles and techniques and their application to probability and the law of total probability in the case of two events will be discussed and investigated.

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