



VCE MATHEMATICAL METHODS

INFORMATION GUIDE

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RATIONALE

This study is designed to provide access to worthwhile and challenging mathematical learning. It is designed to promote students' awareness of the importance of mathematics in everyday life in a technological society and globalised world, and to develop confidence and the disposition to make effective use of mathematical concepts, processes and skills in practical and theoretical contexts. Mathematical Methods Units provides for the study of simple elementary functions, transformations and combinations of these functions, algebra, calculus, probability and statistics, and their applications in a variety of practical and theoretical contexts.

UNIT 1

Area of Study 1

Functions, relations and graphs

In this area of study students cover the graphical representation of simple algebraic functions (polynomial and power functions) of a single real variable and the key features of functions and their graphs such as axis intercepts, domain (including the concept of maximal, natural or implied domain), co-domain and range, stationary points, asymptotic behaviour and symmetry. The behaviour of functions and their graphs is to be explored in a variety of modelling contexts and theoretical investigations.

Area of Study 2

Algebra, number and structure

This area of study supports students' work in the 'Functions, relations and graphs', 'Calculus' and 'Data analysis, probability and statistics' areas of study, and content is to be distributed between Units 1 and 2.

In Unit 1 the focus is on the algebra of polynomial functions of low degree and transformations of the plane.

Area of Study 3

Calculus

In this area of study students cover constant and average rates of change and an introduction to instantaneous rate of change of a function in familiar contexts, including graphical and numerical approaches to estimating and approximating these rates of change.

Area of Study 4

Data analysis, probability and statistics

In this area of study students cover the concepts of experiment (trial), outcome, event, frequency, probability and representation of finite sample spaces and events using various forms such as lists, grids, Venn diagrams and tables. They also cover introductory counting principles and techniques and their application to probability.

UNIT 2

Area of Study 1

Functions, relations and graphs

In this area of study students cover graphical representation of circular, exponential and logarithmic functions of a single real variable and the key features of graphs of functions such as axis intercepts, domain (including maximal, natural or implied domain), co-domain and range, asymptotic behaviour, periodicity and symmetry. The behaviour of functions and their graphs is to be explored in a variety of modelling contexts and theoretical investigations.

Area of Study 2

Algebra, number and structure

This area of study supports students' work in the 'Functions, relations and graphs', 'Calculus' and 'Data analysis, probability and statistics' areas of study. In Unit 2 the focus is on the algebra of some simple transcendental functions and transformations of the plane

Area of Study 3

Calculus

In this area of study students cover differentiation and anti-differentiation of polynomial functions by rule, different notations, and related applications including the analysis of graphs.

Area of Study 4

Data analysis, probability and statistics

In this area of study students cover the use of lists, tables and diagrams to calculate probabilities, including consideration of complementary, mutually exclusive, conditional and independent events involving one, two or three events (as applicable), including rules for computation of probabilities for compound events.

CAREER OPTIONS

- Accountant
- Actuary
- Architect
- Business Analyst
- Electrical Engineering
- Environmental Engineer
- Meteorologist
- Pilot
- Programming

Unit 3 & 4

Area of Study 1

Functions, relations and graphs

In this area of study students cover transformations of the plane and the behaviour of some elementary functions of a single real variable, including key features of their graphs such as axis intercepts, stationary points, points of inflection, domain (including maximal, implied or natural domain), co-domain and range, asymptotic behaviour and symmetry. The behaviour of functions and their graphs is to be explored in a variety of modelling contexts and theoretical investigations

Area of Study 2

Algebra, number and structure

In this area of study students cover the algebra of functions, including composition of functions, inverse functions and the solution of equations. They also study the identification of appropriate solution processes for solving equations, and systems of simultaneous equations, presented in various forms. Students also cover recognition of equations and systems of equations that are solvable using inverse operations or factorisation, and the use of graphical and numerical approaches for problems involving equations where exact value solutions are not required, or which are not solvable by other methods.

Area of Study 3

Calculus

In this area of study students cover graphical treatment of limits, continuity and differentiability of functions of a single real variable, and differentiation, anti-differentiation and integration of these functions. This material is to be linked to applications in practical situations.

Area of Study 4

Data analysis, probability and statistics

In this area of study students cover discrete and continuous random variables, their representation using tables, probability functions (specified by rule and defining parameters as appropriate); the calculation and interpretation of central measures and measures of spread; and statistical inference for sample proportions. The focus is on understanding the notion of a random variable, related parameters, properties and application and interpretation in context for a given probability distribution.



To find out more information
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This flyer is correct as of July 2024, however may be subject to change.