



Australian Government

MEM23004 Apply technical mathematics

Release: 1

MEM23004 Apply technical mathematics

Modification History

Release 1. Supersedes and is equivalent to MEM23004A Apply technical mathematics.

Application

This unit of competency defines the skills and knowledge required to apply mathematical analysis, graphical and software techniques to engineering problems. It includes exponential and logarithmic functions, trigonometric equations involving single and double angles, sequences and series, two-dimensional vector analysis, complex numbers, determinants and matrices.

The unit applies to engineering or related activities requiring specific mathematical techniques and is suitable for people giving technical support to design, operations or maintenance activities and those pursuing technical qualifications and careers at paraprofessional or technician level.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Engineering science

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine scope of technical mathematical techniques required for an engineering application	1.1 Analyse an engineering application for required technical mathematical tasks 1.2 Develop systematic methods for layout and solution checking 1.3 Determine mathematical software required for analytical and graphical solutions and validate software using traditional solutions to simple examples
2. Apply technical mathematical techniques to engineering	2.1 Use appropriate software for analytical and graphical solutions 2.2 Convert between different number systems

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
application	2.3 Use appropriate mathematical techniques required for analysis and solution 2.4 Use appropriate data representations to communicate the solution to others 2.5 Report results and document calculations, graphs and analysis

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Engineering applications requiring mathematical techniques include:	• vector analysis of force systems on beams and bodies • trigonometric plots related to waveforms for amplitude, frequency and phase shift analysis • matrix and determinant solutions of vector systems or simultaneous equations • complex plane analysis of control systems for stability analysis.
Scope of technical mathematical techniques includes:	• standard mathematical software • decimal, binary and hexadecimal number systems • graph exponential and logarithmic functions required for the engineering application • trigonometric equations involving single and double angles • problems using simple binomials and polynomials • problems involving simple sequences and series in the engineering application • two-dimensional vectors • complex numbers and represent graphically • simple algebraic and vectorial problems using determinants and matrices

	• evaluate probability as a predictive tool in simple situations.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23004A Apply technical mathematics

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>