



Australian Government

Assessment Requirements for MEM23007 Apply calculus to engineering tasks

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM23007A Apply calculus to engineering tasks

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- analysing engineering applications to determine relevant calculus techniques
- applying relevant differentiation and integration concepts and tools to engineering applications on at least two occasions
- solving mathematical problems related to engineering and manufacturing using calculus techniques including method of substitution and using trigonometric identities on at least two occasions
- validating results of mathematical problems using calculus either analytically and/or graphically
- manipulating engineering and manufacturing-related mathematical functions and equations using calculus techniques on at least two occasions
- analysing mathematical problems by using appropriate calculus techniques to achieve engineering and manufacturing solutions on at least two occasions
- communicating results of calculus-based analysis in accordance with procedures.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- how to identify appropriate limits and their application to engineering problems being solved with calculus techniques
- differentiation rules and techniques
- partial differentiation
- relationship between differentiation and attributes of mathematical curves and graphs
- optimisation of variables based on maximum and minimum values of mathematical curves and graphs
- integration as the reverse of differentiation
- integration rules and techniques
- definite integral
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Assessment Conditions

- Assessors must:
 - have vocational competency in applying calculus in engineering situations at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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Links

Companion Volume implementation guides are found in VETNet -

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