



Australian Government

**MEM12026 Perform advanced trade
calculations in a manufacturing,
engineering or related environment**

Release: 1

MEM12026 Perform advanced trade calculations in a manufacturing, engineering or related environment

Modification History

Release 1. New unit

Application

This unit of competency defines the skills and knowledge required to apply advanced mathematics to appropriate engineering post-trade situations within the individual’s area of work.

It applies to the use of trigonometry, the sine and cosine rules, work-related formulae, geometric principles relevant to the workplace and the calculation of areas and volumes of common engineering shapes.

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

Band: B

Unit Weight: 4

Pre-requisite Unit

MEM12024	Perform computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Measurement

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Determine job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

		1.3	Identify job requirements from specifications, drawings, job sheets or work instructions
		1.4	Establish required calculation outcomes from job instructions
2	Determine required calculation method	2.1	Determine required calculation method to suit the application, including selection of relevant formulae
		2.2	Estimate expected results, including rounding off, as appropriate
3	Apply calculation method	3.1	Apply calculation method to obtain accurate answer
		3.2	Check answer against estimation

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Calculations are performed using one (1) or more of the following:

- pen and paper
- a calculator
- tables
- tablets
- computers

Calculations include

- angles

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establishing solutions associated with one (1) or more of the following:

- lengths
- areas
- perimeters
- volumes

Calculation methods include the following:

- trigonometry:
 - basic functions
 - sine rule
 - cosine rule
- Pythagoras Theorem
- geometry

Unit Mapping Information

Release 1. No equivalent unit

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM12026 Perform advanced trade calculations in a manufacturing, engineering or related environment

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures and safe work practices
- obtaining and interpreting data from specifications, drawings, job sheets or work instructions to establish required outcomes
- determining the appropriate calculation method to suit the application
- performing calculations using:
 - trigonometric ratios
 - Pythagoras Theorem
 - geometric formulae
- manipulation of formulae to change the subject
- checking answers using estimations.

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:

- safe work practices and procedures
- formulae applicable to the determination of perimeter, area and volume of simple geometric shapes
- the reasons for ensuring calculations are carried out using the same units of measurement
- nomenclature used in trigonometry, Pythagoras' Theorem and geometry
- mathematical principles and order of operations
- techniques and procedures for rounding off figures when estimating approximate answers
- applications of geometric calculations in manufacturing and engineering situations.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing computations 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. This must 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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