



Australian Government

MARL009 Perform basic marine engineering calculations

Release: 1

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Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to perform basic marine engineering calculations required for the operation of marine machinery and equipment.

This unit applies to people working in the maritime industry as a Marine Engineering Watchkeeper on commercial vessels greater than 750 kW or as an Engineer Class 3 Near Coastal.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

L - Marine Engineering

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1 Apply mathematical formulae to solve marine engineering problems

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|-----|--|
| 1.1 | Proportions, variation, percentages and averages are calculated, and method of unity is applied |
| 1.2 | Problems involving the manipulation of indices are solved |
| 1.3 | Written descriptions of actual or hypothetical marine engineering problems are expressed in mathematical terms |
| 1.4 | Algebraic formulae and equations are manipulated to change subjects, as and when required |
| 1.5 | Index problems are converted to logarithmic problems, and vice versa, according to the Law of Logarithms |

	1.6	Calculator is used to resolve marine engineering problems
2 Calculate areas, volumes and masses of regular and irregular figures	2.1	Problems related to areas and volumes of regular geometric figures are solved using standard formulae
	2.2	Problems relating to surface areas and volumes of circular figures are solved
	2.3	Centres of gravity and centroids of area are found for both line figures and areas
	2.4	Concept of density is applied to calculate masses
3 Apply trigonometry to solve problems relating to angular measurement and the resolution of vectors	3.1	Basic trigonometric ratios of sine, cosine and tangent, together with their reciprocals are explained with respect to the sides of a right-angled triangle
	3.2	Pythagoras' Theorem is proved
	3.3	Problems associated with single angle trigonometric identities including those derived from the application of Pythagoras' Theorem to the basic sin, cos and tan identities are solved
	3.4	Derivation of multiple, double and half angle trigonometric identities are shown and used to simplify complicated trigonometric expressions and identities
	3.5	Sine Rule and Cosine Rule for solution of triangles are proved and applied

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

Specifies 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.

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Not Applicable.

Unit Mapping Information

This is a new unit. This unit is equivalent to MARL5012A Perform basic marine engineering calculations.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>