



Australian Government

Department of Education, Employment and Workplace Relations

ICAB4224B Apply mathematical techniques for software development

Release: 1

ICAB4224B Apply mathematical techniques for software development

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit defines the competency required to use basic mathematical methods and operations with real numbers and their precedence, the evaluation and construction of formulae in standard and computer notation and the use of Boolean algebra, data types and computer storage. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Manipulate algebraic terms, leading to the solution of linear equations	1.1. Position number types on the number line 1.2. Evaluate various numerical expressions involving integers, fractions and indices 1.3. Simplify various algebraic expressions involving integers, fractions and indices
2. Construct mathematical formulae	2.1. Solve simple equations 2.2. Convert formulae between standard algebraic form and computer form 2.3. Create several formulae in standard algebraic form and in computer form
3. Simplify and evaluate Boolean expressions and formulae	3.1. Simplify and evaluate several Boolean expressions 3.2. Complete truth tables based on simple Boolean expressions and logic 3.3. Simplify and evaluate several formulae
4. Manipulate number and character representation systems	4.1. Convert numbers between binary, decimal and hexadecimal number systems 4.2. Add, subtract and multiply numbers in binary 4.3. Determine binary memory storage of an integer and a character

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- Problem solving skills with real numbers
- Manipulation of algebraic terms and equations
- Evaluation of Boolean expressions and formulae
- Integer and character storage in bytes in computer memory

Required knowledge

- Basic understanding of mathematical terms and operations
- Calculation tools

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the following is essential:

- Assessment must confirm the ability to solve and evaluate various mathematical problems, and demonstrate an understanding of use and manipulation of Boolean algebra, number types and memory storage in various computational contexts.
- Knowledge and skills in this competency are expected to give the person a good understanding of the use of mathematical ideas and techniques.

Context of and specific resources for assessment

Mathematics and algebraic manipulation forms the underpinning structure of computer architecture and memory storage as well as programming languages.

The breadth, depth and complexity of knowledge and skills in this competency would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance would be involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Assessment must ensure:

- Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills would be characteristic.
- Applications may involve responsibility for, and limited organisation of, others.

EVIDENCE GUIDE**Method of assessment**

The purpose of this unit is to define the standard of performance to be achieved in the workplace. In undertaking training and assessment activities related to this unit, consideration should be given to the implementation of appropriate diversity and accessibility practices in order to accommodate people who may have special needs. Additional guidance on these and related matters is provided in ICA05 Section 1.

- Competency in this unit should be assessed using summative assessment to ensure consistency of performance in a range of contexts. This unit can be assessed either in the workplace or in a simulated environment. However, simulated activities must closely reflect the workplace to enable full demonstration of competency.
- Assessment will usually include observation of real or simulated work processes and procedures and/or performance in a project context as well as questioning on underpinning knowledge and skills. The questioning of team members, supervisors, subordinates, peers and clients where appropriate may provide valuable input to the assessment process. The interdependence of units for assessment purposes may vary with the particular project or scenario.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

An individual demonstrating this competency would be able to:

- Demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- Apply solutions to a defined range of unpredictable problems
- Identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- Identify, analyse and evaluate information from a variety of sources
- Take responsibility for own outputs in relation to

EVIDENCE GUIDE

	specified quality standards • Take limited responsibility for the quantity and quality of the output of others • Maintain knowledge of industry products and services
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Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Boolean expressions</i> may include the use of:	• AND • OR • NOT
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Unit Sector(s)

Unit sector	Build
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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