



Australian Government

ICTPRG442 Apply mathematical techniques for software development

Release: 1

ICTPRG442 Apply mathematical techniques for software development

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 6.0.

Application

This unit describes the skills and knowledge required to use basic mathematical methods and operations in standard computer notation, Boolean algebra, data types and computer storage.

It applies to those who are involved in software development roles who are required to use mathematical constructions in programming.

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

Unit Sector

Programming and software development

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Establish task requirements	1.1 Identify and configure software development environment according to business need 1.2 Discuss and confirm software development task and intent according to business need 1.3 Identify and discuss different mathematical techniques in software development
2. Manipulate number and character representation systems in a software	2.1 Convert numbers between binary, decimal and hexadecimal number systems

ELEMENT	PERFORMANCE CRITERIA
development context	2.2 Add, subtract and multiply numbers in binary 2.3 Determine binary memory storage of an integer and a character
2. Manipulate algebraic terms and solve linear equations in a software development context	3.1 Position number types on number line 3.2 Evaluate various numerical expressions involving integers, fractions and indices 3.3 Simplify various algebraic expressions involving integers, fractions and indices
4. Construct, simplify and evaluate expressions and mathematical formulas in a software development context	4.1 Solve simple equations 4.2 Convert formulas between standard algebraic form and computer notation 4.3 Create formulas in standard algebraic form and in computer notation 4.4 Simplify and evaluate Boolean expressions and formulas 4.5 Complete truth tables using simple Boolean expressions and logic 4.6 Save and confirm work with required personnel

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

SKILL	DESCRIPTION
Oral communication	Uses listening and questioning techniques to articulate information and task requirements using specific language applicable to audience
Numeracy	Uses a wide range of mainly formal and some informal, oral and written mathematical language and representation when solving equations, constructing mathematical formulas, simplifying and evaluating Boolean expressions and formulas and manipulating number and character systems
Reading	Interprets and critically analyses information from a variety of sources and records
Planning and organising	Plans and sequences complex tasks

SKILL	DESCRIPTION
Problem solving	• Uses analytical processes and decides on a course of action when evaluating Boolean expressions and formulas

Unit Mapping Information

Supersedes and is equivalent to ICTPRG417 Apply mathematical techniques for software development.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTPRG442 Apply mathematical techniques for software development

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- manipulate algebraic terms and evaluate at least three numerical expressions in software development
- solve and evaluate at least three different mathematical problems
- create at least two mathematical formulas in standard algebraic form and at least two mathematical formulas in standard computer notation
- simplify and evaluate at least two Boolean expressions and formulas
- convert two sets of numeric values between binary, decimal and hexadecimal number systems as required in software development.

Knowledge Evidence

elements, performance criteria and foundation skills of this unit, including knowledge of:

- Boolean algebra, number types, numerical and algebraic expressions, simple equations and standard computer notation that may be used to apply mathematical techniques for software development
- binary, decimal and hexadecimal number systems
- memory requirements for different number formats including binary, integer, decimal and negatives
- mathematical terms application and operations in computing
- calculation tools available
- organisational procedures impacting on applying mathematical techniques for software development.

Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- programming language, tools and licensing
- software development tools and environment
- hardware components and required software.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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