



Australian Government

FSKNUM039 Use introductory calculus for work

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with FSK Foundation Skills Training Package Version 2.0.

Application

This unit describes the skills and knowledge to apply basic concepts of calculus to work-related problems. It includes extracting and analysing mathematical information relevant to calculus, applying calculus techniques to the solution of workplace problems, and communicating the mathematical information.

An individual performing these tasks works autonomously and accesses and evaluates support from a broad range of sources as needed.

This unit applies to individuals who use, or are preparing to use, numeracy skills to complete workplace activities. This includes existing workers and individuals preparing for employment through vocational education and training. This unit should be integrated and contextualised with vocational training to support achievement of vocational competency.

This unit is aligned to, but does not fully address, the Australian Core Skills Framework (ACSF) numeracy core skill indicators .09, .10 and .11 at level 5 in the workplace and employment domain of communication.

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

Unit Sector

Numeracy

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. Extract and analyse information relevant to introductory calculus	1.1 Extract highly embedded mathematical information relevant to introductory calculus from a broad range of highly complex workplace texts and tasks 1.2 Incorporate information from other sources to inform and support

Element	Performance Criteria
	analysis of the extracted information, where necessary 1.3 Analyse and synthesise information relevant to introductory calculus required to complete workplace task
2. Calculate limits and find simple derivatives for workplace tasks	2.1 Select method of solution from an expanded range of highly developed mathematical problem solving strategies and processes to complete workplace task 2.2 Estimate outcome of analysis related to using specialised mathematical problem solving strategies and application of introductory calculus based analysis to complete workplace task 2.3 Evaluate, solve and sketch functions relevant to workplace 2.4 Find limits relevant to workplace 2.5 Differentiate simple polynomial functions and use correct notation 2.6 Check outcomes and critically review mathematics used and real-world implications of results using developed estimation and evaluation techniques
3. Communicate information	3.1 Use formal and specialised written mathematical representation and symbolism to document, interpret and communicate mathematical thinking, problem solving process, outcomes and implications 3.2 Use specialised mathematical and general language to discuss, explain and interpret the mathematical processes, results and implications

Foundation Skills

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

Skill	Description
Technology	Uses a scientific calculator and/or graphing software

Mapping Information

Supersedes and is equivalent to FSKNUM39 Use introductory calculus for work.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=f572fe10-a855-4986-9295-3852c771f178>

Assessment Requirements for FSKNUM039 Use introductory calculus for work

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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:

- perform a broad range of multi-step mathematical problem solving processes using introductory calculus to complete a workplace task, including:
 - sketching graphs of linear and quadratic functions and solving equations of the form $f(x) = 0$
 - applying and calculating limits
 - applying and calculating the derivative of polynomial functions
 - interpreting the gradient at a given point on the graph of a polynomial function
- make estimations to check problem solving outcomes and determine appropriate accuracy required for above workplace task
- critically review mathematical processes and outcomes obtained, and evaluate real-world implications.

In the course of the above the candidate must demonstrate use and application of relevant technology.

Knowledge Evidence

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

- purpose and application of basic calculus to workplace contexts
- key features of, and differences between numbers, functions and relations and their properties
- key features of linear and quadratic functions
- purpose, application and calculation of the derivative of polynomial functions
- problem solving techniques to analyse results
- purpose and use of relevant technology, such as a CAS calculator, spreadsheets or other mathematical or workplace software
- implications of calculations and results for workplace tasks

- developed estimation and evaluation processes
- specialised and formal mathematical language and symbolism relevant to workplace task.
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Assessment Conditions

Competency is to be assessed in the workplace, a workplace simulated environment or a vocational training context.

Assistive technologies can be utilised to assist with oral and written communication.

Skills must be demonstrated independently using highly complex texts and tasks that reflect those typically found in a workplace.

The following resources are to be made available:

- a scientific calculator or graphing software
- own familiar support resources.

Assessors must:

- satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards, and
- have sound knowledge of the ACSF and performance features of the ACSF level being assessed, and
- have demonstrable expertise, knowledge and skills in the vocational contextualisation and assessment of the core skill, numeracy, and
- have completed the following or equivalent:
 - TAESS00009 Address Foundation Skills in Vocational Practice Skill Set; or
 - a higher level education qualification, such as:
 - TAE80113 Graduate Diploma of Adult Language, Literacy and Numeracy Practice (and its equivalent TAE70111); or
 - Bachelor of Education, Graduate Certificate or Graduate Diploma of Education, or higher. This may include qualifications relating to TESOL, adult education or vocational education.
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