



QQI

Quality and Qualifications Ireland
Dearbhú Cáilíochta agus Cáilíochtaí Éireann

Component Specification NFQ Level 4

Mathematics 4N1987

1. Component Details

Title	Mathematics
Teideal as Gaeilge	Matamaitic
Award Type	Minor
Code	4N1987
Level	4
Credit Value	10
Purpose	The purpose of this award is to equip the learner with the relevant knowledge, skill and competence to apply a range of mathematical skills and tools to a variety of contexts, with limited conceptual understanding.
Units	The Learning Outcomes are grouped into the following units: 1 NUMBER 2 GEOMETRY 3 ALGEBRA 4 DATA HANDLING
Learning Outcomes	Learners will be able to: 1 NUMBER 1.1 Discuss the application of number to familiar real life situations 1.2 Calculate conversions to include between currencies, between fractions, decimals and percentages, and from fractions to ratios and ratios to fractions, and

from standard form to scientific notation and scientific notation to standard form

- 1.3 Use appropriate strategies such as rounding off, places of decimal, significant figures, estimation, percentage error, to give approximations, where numbers are from the set of natural numbers (N) and from the set of integers (Z)
- 1.4 Use a calculator with confidence to perform extended calculations, requiring functions such as addition, subtraction, multiplication, division, percent, square root, pi, 1/x, scientific notation keys, memory keys and the clear key, while following the conventions of precedence of operations
- 1.5 Demonstrate an understanding of the laws of indices and the rules of logarithms by using the laws and rules to simplify expressions, solve equations, and transpose formulae
- 1.6 Differentiate between simple interest and compound interest by applying the appropriate given formula to a range of savings and credit options
- 1.7 Apply the percentage function accurately to a range of everyday situations including gross income and net income, pay slips using appropriate statutory deductions, gross profit, net profit and loss on goods sold, VAT inclusive and VAT exclusive prices.

2 GEOMETRY

- 2.1 Describe simple geometric shapes associated with the home and workplace
- 2.2 Recognise folding symmetry and rotational symmetry in common shapes
- 2.3 Plot graphs of ordered pairs in the coordinate plane showing the relationship between two variables, using real life situations and the correct terminology
- 2.4 Use formulae for calculations in the coordinate plane correctly, including distance between two points, mid-point of a line segment, slope of a line, parallel lines, perpendicular lines, equation of a line, equation of a circle with centre (0,0) and radius r, and tangent to a circle
- 2.5 Construct, using drawing instruments, a variety of angles and simple geometric shapes to given criteria to include naming of angle types and sides associated with the shapes and angles

- 2.6 Solve practical problems by using the correct formula(e) to calculate the area and perimeter of a square, rectangle, triangle, and circle, giving the answer in the correct form and using the correct terminology
 - 2.7 Solve practical problems by using the correct formula(e), to calculate the volume/capacity and surface area of a cube, cuboid, cylinder, cone, and sphere, giving the answer in the correct form and using the correct terminology
 - 2.8 Apply standard axioms and theorems of geometry, including Pythagoras Theorem, to solve real life or simulated problems involving straight lines, parallel lines, angles, and triangles.
- 3 ALGEBRA
- 3.1 Discuss the presence of variables in a range of real life situations
 - 3.2 Solve algebraic equations including linear equations of one variable, simultaneous linear equations of two unknowns, and linear inequalities of one variable
 - 3.3 Solve quadratic equations using factors and the quadratic formula
 - 3.4 Construct algebraic expressions and formulae for real life situations using the correct terminology and including rearrangement of formulae.
- 4 DATA HANDLING
- 4.1 Explain basic statistical concepts to include population, sample, dependent, independent and discrete variables
 - 4.2 Present information from data collected from the world wide web or other methods, in graphical and tabular form, including bar charts, pie charts, trend graphs, cumulative frequency curves, histograms and frequency tables
 - 4.3 Calculate the statistics for measuring averages and dispersion of an array of data, to include calculating the mean, mode, and median
 - 4.4 Discuss findings, to include interpretation of results, and suggesting reasons for findings.

General Information

All assessment should be planned in accordance with the programme assessment strategy developed as part of the programme submission for validation. See **Policies and Criteria for Validation of Programmes**. Assessment should be undertaken consistently and reflect current assessment guidelines. See www.qqi.ie.

All FET assessment is criterion referenced. Successful achievement of the award is based on learners attaining the required standards of knowledge, skill or competence consistent with the **minimum intended programme learning outcomes**.

The techniques set out below are considered the optimum approach to assessment for this component. In exceptional circumstances providers may identify alternative assessment techniques through the provider's application for programme validation which are reliable and valid but which are more appropriate to their context.

Assessment of a number of components may be integrated across programmes for delivery, provided that the learning outcomes of each minor award are assessed.

Group or team work may form part of the assessment, provided each learner's achievement is separately assessed.

All providers are required to submit an assessment plan as part of their application for programme validation. Assessment Plans will include information relating to scheduling and integration of assessment. See current FET validation guidelines at www.qqi.ie.

Assessment Techniques

In order to demonstrate that they have reached the standards of knowledge, skill and competence identified in all the learning outcomes, learners are required to complete the assessment(s) below.

The assessor is responsible for devising assessment instruments (e.g. project and assignment briefs, examination papers), assessment criteria and mark sheets, consistent with the techniques identified below and QQI's assessment requirements.

Programme validation will require providers to map each learning outcome to its associated assessment technique. All learning outcomes **must** be assessed and achieved in accordance with the **minimum intended module learning outcomes** set out in the validated programme.

Portfolio / Collection of Work 80%

Description

Portfolio / Collection of Work

A portfolio or collection of work is a collection and/or selection of pieces of work produced by the learner over a period of time that demonstrates achievement of a range of learning outcomes. The collection may be self-generated or may be generated in response to a particular brief or tasks/activities devised by the assessor.

Examination - Theory

An examination provides a means of assessing a learner's ability to recall and apply knowledge, skills and understanding within a set period of time and under clearly specified conditions.

A theory-based examination assesses the ability to recall, apply and understand specific theory and knowledge.

Recognition of Prior Learning (RPL)

To support the development and implementation of RPL with regard to access, granting credit/exemptions and achievement of awards/parts of awards, providers should refer to **QQI's Statutory Guidelines for Quality Assurance**, the **Policies and Criteria for Validation of Programmes** and the **Principles and Operational Guidelines for the Recognition of Prior Learning in Further and Higher Education and Training** available at www.qqi.ie

Grading

Pass	50% - 64%
Merit	65% - 79%
Distinction	80% - 100%

Specific Validation Requirements

The provider must have all of the following in place to offer this award:
 Each candidate will be supplied with a set of Formulae and Tables at examination
 1. Calculators are available to each candidate at examination
 2.

Supporting Documentation

None

Access

To access programmes leading to this award the learner should have reached the standards of knowledge, skill and competence associated with the preceding level of the National Framework of

Qualifications. This may have been achieved through a formal qualification or through relevant life and work experience.

Transfer

Successful completion of this component award enables the learner to transfer to programmes leading to other certificates where this component is a mandatory or an elective requirement.

2. FET Award Standards

QQI award standards are determined within the National Framework of Qualifications (NFQ), <http://www.nfq-qqi.com>. QQI determines standards for the education and training awards that it makes itself and that are made by providers to whom it has delegated authority to make an award. Providers offering programmes leading to QQI awards **must** have their programme(s) validated in accordance with current validation policy (see www.qqi.ie).

Award standards are designed to be consistent with the NFQ's award classes i.e. major, special purpose, supplemental and minor awards. They are expressed in terms of **learning outcomes** i.e. concise statements of what the learner is expected to know or be able to do in order to achieve a particular award. Learning outcomes for FET awards are contained within the associated specifications:

AWARD CLASS	STANDARDS	AWARDS
Major Award	Certificate Specification	Certificate (Levels 1 to 5) Advanced Certificate (Level 6)
Supplemental Award	Supplemental Specification	Supplemental Certificate (Level 3 to 6)
Special Purpose	Specific Purpose Specification	Specific Purpose Certificate (Levels 3 to 6)
Minor Award	Component Specification	Component Certificate (Levels 1 to 6)

Award standards are thresholds, they describe standards of knowledge, skill or competence to be acquired, and where appropriate, demonstrated, by a learner before an award may be made.

Award standards will be reviewed from time to time as necessary. Minor changes may be made by the QQI executive outside the review cycle where necessary. Changes to standards are published on QQI's website. Providers with validated programmes and providers with delegated authority to make awards are responsible for monitoring relevant standards and making necessary responses to changes.

3. FET Credit

Every FET certificate and component specification includes an FET credit value (Table 1). FET credit is quantified in multiples of 5 FET credits (up to 50 hours of learner effort). Learner effort is based on the time taken by typical learners at the level of the award to achieve the learning outcomes for the award. It includes all learning time involved including: guided learning hours, self-directed learning and assessment.

Table 1: FET Credit Values

NFQ Level	Major Awards Credit Values	Default Credit Values Minor Awards	Other Permitted Minor Award Credit Values	Special Purpose and Supplemental Award Credit Value Ranges
1	20	5	10	
2	30	5	10	
3	60	10	5,20	>5 and <60
4	90	10	5,15,20	>5 and <90
5	120	15	5,10,30	>5 and <120
6	120	15	5,10,30	>5 and <120

Guide to Level

Independence is the hallmark of this level. Learning outcomes at this level correspond to a growing sense of responsibility for participating in public life and shaping one's own life. The outcomes at this level would be associated with first-time entry to many occupational sectors.

Strand	Sub-strand	Nature of learning
Knowledge	Breadth	Broad range of knowledge
	Kind	Some theoretical concepts and abstract thinking, with significant depth in some areas
Know How & Skill	Range	Demonstrate a moderate range of practical and cognitive skills and tools
	Selectivity	Select from a range of procedures and apply known solutions to a variety of predictable problems
Competence	Context	Act in familiar and unfamiliar contexts
	Role	Act with considerable amount of responsibility and autonomy
	Learning to Learn	Learn to take responsibility for own learning within a supervised environment
	Insight	Assume partial responsibility for consistency of self-understanding and behaviour

Extract from 'Determinations for the Outline National Framework of Qualifications': NQAI