

National Unit Specification: general information

UNIT Mathematics 3 (Intermediate 2)

NUMBER D323 11

COURSE Mathematics (Intermediate 2)

SUMMARY

This unit seeks to extend the candidate's mathematical experience in the areas of algebra and trigonometry, and to introduce the candidate to quadratic and trigonometric functions. It is an optional unit of the Intermediate 2 Mathematics course.

OUTCOMES

- 1 Perform algebraic operations.
- 2 Use properties of quadratic functions.
- 3 Use further trigonometry.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates will normally be expected to have attained one of the following:

- *Mathematics 1 (Int 2)*
- *Mathematics 2 (Int 2)*
- equivalent

CREDIT VALUE

1 credit at Intermediate 2.

Administrative Information

Superclass: RB

Publication date: November 1999

Source: Scottish Qualifications Authority

Version: 03

© Scottish Qualifications Authority 1999

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this unit specification can be purchased from the Scottish Qualifications Authority. The cost for each unit specification is £2.50 (minimum order £5).

National Unit Specification: general information (cont)

UNIT Mathematics 3 (Intermediate 2)

CORE SKILLS

This unit gives automatic certification of the following:

Complete core skills for the unit	None
--	------

Core skills components for the unit	Using Number	Int 2
-------------------------------------	--------------	-------

Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

National Unit Specification: statement of standards

UNIT Mathematics 3 (Intermediate 2)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

OUTCOME 1

Perform algebraic operations.

Performance criteria

- (a) Reduce an algebraic fraction to its simplest form.
- (b) Apply the four rules to algebraic fractions.
- (c) Change the subject of a formula.
- (d) Simplify surds.
- (e) Simplify expressions using the laws of indices.

OUTCOME 2

Use properties of quadratic functions.

Performance criteria

- (a) Determine the equations of quadratic functions of the form $y = (x + a)^2 + b$ and $y = kx^2$; $a, b, k \in \mathbf{Z}$ from their graphs.
- (b) Identify the nature and co-ordinates of the turning point and the equation of the axis of symmetry of a quadratic of the form $y = k(x + a)^2 + b$; $a, b \in \mathbf{Z}, k = \pm 1$.
- (c) Solve quadratic equations graphically, by factorisation and by using the quadratic formula.

OUTCOME 3

Use further trigonometry.

Performance criteria

- (a) Sketch and identify trigonometric functions involving multiple angles.
- (b) Solve a simple trigonometric equation in degrees.

Evidence requirements

Although there are various ways of demonstrating achievement of the outcomes, evidence would normally be presented in the form of a closed book test under controlled conditions. Examples of such tests are contained in the National Assessment Bank.

In assessments, candidates are required to show their working in carrying out algorithms and processes.

National Unit Specification: support notes

UNIT Mathematics 3 (Intermediate 2)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

Each mathematics unit at Intermediate 2 level aims to build upon and extend candidates' mathematical knowledge and skills. The main aim of this unit is to provide a sound base for progression to Higher level with particular emphasis on algebraic and trigonometric manipulation, solution of equations and graphs of functions. Mathematics at Higher level assumes a competence and a confidence in these areas to the extent that the knowledge and skills can be routinely recalled and applied to the solution of problems in a wide range of contexts.

Outcome 1 requires the demonstration of a comprehensive ability in algebraic processes, ranging from algebraic fractions through manipulation of formulae to operations on surds and use of the laws of indices.

Outcomes 2 and 3 require a demonstration of competence in graphs of quadratic and trigonometric functions, and the solution of both quadratic and trigonometric equations.

The recommended content for this unit can be found in the course specification. The *detailed content* section provides illustrative examples to indicate the depth of treatment required to achieve a unit pass and advice on teaching approaches.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Candidates should be encouraged throughout the unit to make use of their skills of mental calculation, to make efficient use of calculators, and to apply the strategy of checking. Numerical checking, checking the solution of an equation or checking a result against the context in which it is set are integral to every mathematical process. In many instances, the checking can be done mentally, but on occasions, to stress its importance, there should be evidence of a checking procedure within the process. There are various checking procedures which could be used:

- relating to a context - 'How sensible is my answer?'
- estimate followed by a repeated calculation
- calculation in a different order.

National Unit Specification: support notes (cont)

UNIT Mathematics 3 (Intermediate 2)

Further advice on learning and teaching approaches is contained within the Subject Guide for Mathematics.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

The assessment for this unit will normally be in the form of a closed book test. Such tests should be carried out under supervision and it is recommended that candidates attempt an assessment designed to assess all the outcomes within the unit. Successful achievement of the unit is demonstrated by candidates achieving the thresholds of attainment specified for all the outcomes in the unit. Candidates who fail to achieve the threshold(s) of attainment need only be retested on the outcome(s) where the outcome threshold score has not been attained. Further advice on assessment and retesting is contained within the National Assessment Bank.

It is expected that candidates will be able to achieve the algebraic and trigonometric performance criteria in the unit without the use of computer software or sophisticated calculators.

In assessments, candidates are required to show their working in carrying out algorithms and processes.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).