



Mathematics: Expressions and Formulae (National 4)

SCQF: level 4 (6 SCQF credit points)

Unit code: H22F 74

Unit outline

The general aim of this Unit is to develop skills linked to straightforward mathematical expressions and formulae. These include the manipulation of abstract terms, the simplification of expressions and the evaluation of formulae. The Outcomes cover aspects of algebra, geometry, statistics and reasoning.

Learners who complete this Unit will be able to:

- 1 Use mathematical operational skills linked to expressions and formulae
- 2 Use mathematical reasoning skills linked to expressions and formulae

This Unit is a mandatory Unit of the National 4 Mathematics Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in *Unit Assessment Support*.

The *Added Value Unit Specification* for the National 4 Mathematics Course gives further mandatory information on Course coverage for learners taking this Unit as part of the National 4 Mathematics Course.

Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- ◆ National 3 Lifeskills Mathematics Course or its Units

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Unit.

Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information, please refer to the *Unit Support Notes*.

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

1 Use mathematical operational skills linked to expressions and formulae by:

- 1.1 Applying algebraic skills to manipulating expressions and working with formulae
- 1.2 Applying geometric skills to circumference, area and volume
- 1.3 Applying statistical skills to representing and analysing data and to probability

Outcome 2

The learner will:

2 Use mathematical reasoning skills linked to expressions and formulae by:

- 2.1 Interpreting a situation where mathematics can be used and identifying a valid strategy
- 2.2 Explaining a solution and/or relating it to context

Evidence Requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used. They should ensure there is sufficient evidence of competence in algebraic, geometric, statistical and reasoning skills from the Outcomes and Assessment Standards to allow a judgement to be made that the learner has achieved the Unit.

Assessors should use their professional judgement when giving learners credit for an appropriate degree of accuracy. This may mean giving credit for incomplete solutions or numerically incorrect solutions which show correct methodology, therefore demonstrating required knowledge and understanding of the algebraic, geometric and statistical processes involved.

Evidence may be presented for individual Outcomes or it may be gathered for the Unit as a whole through integrating assessment in a single activity. If the latter approach is used, it must be clear how the evidence covers each Outcome.

A calculator or equivalent technologies may be used.

For this Unit, learners will be required to produce evidence as follows:

For Outcome 1: Learners will be required to provide evidence for each of the assessment standards linked to expressions and formulae by drawing on the following sub-skills:

Algebraic skills — using the distributive law in an expression with a numerical common factor to produce a sum of terms; factorising a sum of terms with a numerical common factor; simplifying an expression which has more than one variable; evaluating an expression or a formulae which has more than one variable; extending a straightforward number or diagrammatic pattern and determining its formula; calculating the gradient of a straight line from horizontal and vertical distances

Geometric skills — calculating the circumference and area of a circle; calculating the area of a parallelogram, kite, trapezium; investigating the surface of a prism; calculating the volume of a prism; using rotational symmetry

Statistical skills — constructing a frequency table with class intervals from raw data; determining statistics of a data set; interpreting calculated statistics; representing raw data in a pie chart; using probability

For Outcome 2: Evidence of reasoning skills can be collected separately or combined with evidence for Outcome 1.

Exemplification of assessment is provided in *Unit Assessment Support*. Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes*.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy

- 2.1 Number processes
- 2.2 Money, time and measurement
- 2.3 Information handling

5 Thinking skills

- 5.3 Applying
- 5.4 Analysing and evaluating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work*. The level of these skills should be at the same SCQF level as the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit Support Notes*.

Administrative information

Published: June 2013 (version 1.1)

Superclass: RB

History of changes to National Unit Specification

| Version | Description of change | Authorised by | Date |
|---------|--|------------------------------------|-----------|
| 1.1 | Phrase added to clarify evidence requirements. | Qualifications Development Manager | June 2013 |
| | | | |
| | | | |
| | | | |

This specification 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 can be downloaded from SQA's website at www.sqa.org.uk.

Note: readers are advised to check SQA's website: www.sqa.org.uk to ensure they are using the most up-to-date version of the Unit Specification.

© Scottish Qualifications Authority 2013