



National 5
Course Assessment
Specification



National 5 Mathematics Course Assessment Specification (C747 75)

Valid from August 2013

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Please refer to the note of changes at the end of this Course Assessment Specification for details of changes from previous version (where applicable).

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Course outline

Course title:	National 5 Mathematics
SCQF level:	5 (24 SCQF credit points)
Course code:	C747 75
Course assessment code:	X747 75

The purpose of the Course Assessment Specification is to ensure consistent and transparent assessment year on year. It describes the structure of the Course assessment and the mandatory skills, knowledge and understanding that will be assessed.

Course assessment structure

Component 1 — question paper: Paper 1 (Non-Calculator)	40 marks
Component 2 — question paper: Paper 2	50 marks
Total marks	90 marks

This Course includes six SCQF credit points to allow additional time for preparation for Course assessment. The Course assessment covers the added value of the Course.

Equality and inclusion

This Course Assessment Specification has been designed to ensure that there are no unnecessary barriers to assessment. Assessments have been designed to promote equal opportunities while maintaining the integrity of the qualification.

For guidance on assessment arrangements for disabled learners and/or those with additional support needs, please follow the link to the Assessment Arrangements web page: www.sqa.org.uk/sqa/14977.html.

Guidance on inclusive approaches to delivery and assessment of this Course is provided in the *Course Support Notes*.

Assessment

To gain the award of the Course, the learner must pass all of the Units as well as the Course assessment. Course assessment will provide the basis for grading attainment in the Course award.

Course assessment

SQA will produce and give instructions for the production and conduct of Course assessments based on the information provided in this document.

Added value

The purpose of the Course assessment is to assess added value of the Course as well as confirming attainment in the Course and providing a grade. The added value for the Course will address the key purposes and aims of the Course, as defined in the Course Rationale. It will do this by addressing one or more of breadth, challenge, or application.

In this Course assessment, added value will focus on the following:

- ◆ breadth — drawing on knowledge and skills from across the Course
- ◆ challenge — requiring greater depth or extension of knowledge and/or skills
- ◆ application — requiring application of knowledge and/or skills in practical or theoretical contexts as appropriate

This added value consists of:

- ◆ the development of mathematical operational skills beyond the minimum competence required for the Units
- ◆ the integration of mathematical operational skills developed across the Units
- ◆ the development of mathematical reasoning skills beyond the minimum competence required for the Units
- ◆ the application of skills of numerical calculation without the aid of a calculator in order to demonstrate that the learner has an underlying grasp of mathematical processes

To achieve success in the Course, learners must show that they can apply knowledge and skills acquired across the Course to unseen situations.

There are two question papers requiring learners to demonstrate aspects of breadth, challenge and application in mathematical contexts. In one of the question papers the use of a calculator will be permitted. Learners will apply breadth and depth of knowledge and skills from across the Units to answer appropriately challenging questions.

Grading

Course assessment will provide the basis for grading attainment in the Course award.

The Course assessment is graded A–D. The grade is determined on the basis of the total mark.

A learner's overall grade will be determined by their performance across the Course assessment.

Grade description for C

For the award of Grade C, learners will have demonstrated successful performance in all of the Units of the Course. In the Course assessment, learners will typically have demonstrated successful performance in relation to the mandatory skills, knowledge and understanding for the Course.

Grade description for A

For the award of Grade A, learners will have demonstrated successful performance in all of the Units of the Course. In the Course assessment, learners will typically have demonstrated a consistently high level of performance in relation to the mandatory skills, knowledge and understanding for the Course.

Credit

To take account of the extended range of learning and teaching approaches, remediation, consolidation of learning and integration needed for preparation for external assessment, six SCQF credit points are available in Courses at National 5 and Higher, and eight SCQF credit points in Courses at Advanced Higher. These points will be awarded when a grade D or better is achieved.

Structure and coverage of the Course assessment

The Course assessment will consist of two Components: a question paper titled Paper 1 (Non-Calculator), and a question paper titled Paper 2.

Component 1 — question paper: Paper 1 (Non-Calculator)

The purpose of this question paper is to assess mathematical skills without the aid of a calculator.

This question paper will give learners, without the aid of a calculator, an opportunity to apply numerical, algebraic, geometric, trigonometric, statistical and reasoning skills specified in the table provided in 'Further mandatory information on Course coverage' section at the end of this Course Assessment Specification.

These skills are those in which the learner is required to show an understanding of underlying processes. They will involve the ability to use numerical skills within mathematical contexts in cases where a calculator may compromise the assessment of this understanding.

This question paper will have 40 marks out of a total of 90 marks.

It will consist of short-answer and extended response questions.

Component 2 — question paper: Paper 2

The purpose of this question paper is to assess mathematical skills. A calculator may be used.

This question paper will give learners an opportunity to apply numerical, algebraic, geometric, trigonometric, statistical and reasoning skills specified in the table provided in 'Further mandatory information on Course coverage' section at the end of this Course Assessment Specification.

These skills are those which may be facilitated by the use of a calculator allowing more opportunity for application.

This question paper will have 50 marks out of a total of 90 marks.

This question paper will consist of short-answer and extended response questions.

For more information about the structure and coverage of the Course assessment, refer to the [Question Paper Brief](#).

Setting, conducting and marking of assessment

Question paper — Paper 1 (Non-Calculator)

This question paper will be set and marked by SQA, and conducted in centres under conditions specified for external examinations by SQA. Learners will complete this in 1 hour.

Question paper — Paper 2

This question paper will be set and marked by SQA, and conducted in centres under conditions specified for external examinations by SQA. Learners will complete this in 1 hour 30 minutes.

Further mandatory information on Course coverage

The following gives details of mandatory skills, knowledge and understanding for the National 5 Mathematics Course. Course assessment will involve sampling the skills, knowledge and understanding.

Algebraic skills	
The learner will use these algebraic skills and apply them in context	
Working with algebraic expressions involving expansion of brackets	<ul style="list-style-type: none"> ◆ $a(bx + c) + d(ex + f)$ ◆ $ax(bx + c)$ ◆ $(ax + b)(cx + d)$ ◆ $(ax + b)(cx^2 + dx + e)$ where a, b, c, d, e, f are integers \mathbb{Z}
Factorising an algebraic expression	<ul style="list-style-type: none"> ◆ common factor ◆ difference of squares ◆ trinomials and combinations of these
Completing the square in a quadratic expression with unitary x^2 coefficient	
Reducing an algebraic fraction to its simplest form	a/b where a, b are of the form $(mx + p)^n$ or $(mx + p)(nx + q)$ $b \neq 0$
Applying the four operations to algebraic fractions	$\frac{a}{b} * \frac{c}{d}$ where a, b, c, d can be simple constants, variables or expressions. * can be add, subtract, multiply or divide $b \neq 0, d \neq 0$
Determining the equation of a straight line	<ul style="list-style-type: none"> ◆ use the formula $y - b = m(x - a)$ or equivalent to find the equation of a straight line, given two points or one point and the gradient of the line ◆ use functional notation ◆ identify gradient and y-intercept from various forms of the equation of a straight line
Working with linear equations and inequations	<ul style="list-style-type: none"> ◆ numerical coefficients are rational numbers \mathbb{Q} ◆ numerical solutions are rational numbers \mathbb{Q}
Working with simultaneous equations	<ul style="list-style-type: none"> ◆ construct from text ◆ graphical solution ◆ algebraic solution
Changing the subject of a formula	<ul style="list-style-type: none"> ◆ linear equation ◆ equation involving a simple square or square root
Recognise and determine the equation of a quadratic function from its graph	Equations of the form $y = kx^2$ and $y = (x + p)^2 + q$ k, p, q are integers (\mathbb{Z}). Also, $y = k(x + p)^2 + q$ where $k \in \mathbb{Z}$
Sketching a quadratic function	Equations of the form $y = (ax - m)(bx - n)$ or the form $y = k(x + p)^2 + q$ where $k = 1$ or -1 a, b, m, n, p, q are integers (\mathbb{Z}). Also, $y = k(x + p)^2 + q$ where $k \in \mathbb{Z}$

Identifying features of a quadratic function	Identify nature, coordinates of turning point and the equation of the axis of symmetry of a quadratic of the form $y = k(x + p)^2 + q$ where $k = 1$ or -1 p, q are integers (\mathbb{Z}). Also, $y = k(x + p)^2 + q$ where $k \in \mathbb{Z}$
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Solving a quadratic equation which has been factorised	Solving from factorised form Graphical treatment
Solving a quadratic equation using the quadratic formula	Solving using the quadratic formula
Using the discriminant to determine the number of roots	Know and use the discriminant Determine the number or nature of roots

Geometric skills	
The learner will use these geometric skills and apply them in context	
Determining the gradient of a straight line, given two points	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Calculating the length of arc or the area of a sector of a circle	
Calculating the volume of a standard solid	Sphere, cone, pyramid
Applying Pythagoras' theorem	Using Pythagoras' theorem in complex situations including converse and 3D
Applying the properties of shapes to determine an angle involving at least two steps	<ul style="list-style-type: none"> ◆ quadrilaterals/triangles/polygons/circles ◆ relationship in a circle between the centre, chord and perpendicular bisector
Using similarity	Interrelationship of length, area and volume
Working with 2D vectors	Adding or subtracting two-dimensional vectors using directed line segments
Working with 3D coordinates	Determining coordinates of a point from a diagram representing a 3D object
Using vector components	Adding or subtracting two- or three-dimensional vectors using components
Calculating the magnitude of a vector	Magnitude of a two or three dimensional vector

Trigonometric skills	
The learner will use these trigonometric skills and apply them in context	
Working with the graphs of trigonometric functions	<ul style="list-style-type: none"> ◆ basic graphs ◆ amplitude ◆ vertical translation ◆ multiple angle ◆ phase angle
Working with trigonometric relationships in degrees	<ul style="list-style-type: none"> ◆ sine, cosine and tangent of angles $0^\circ - 360^\circ$ ◆ period ◆ related angles ◆ solve basic equations ◆ identities $\tan x = \frac{\sin x}{\cos x}$ $\cos^2 x + \sin^2 x = 1,$
Calculating the area of a triangle using trigonometry	◆ Area = $\frac{1}{2} ab \sin C$
Using the sine and cosine rules to find a side or angle in a triangle	<ul style="list-style-type: none"> ◆ sine rule for side and angle ◆ cosine rule for side ◆ cosine rule for angle
Using bearings with trigonometry	◆ To find a distance or direction

Numerical skills	
The learner will use these numerical skills and apply them in context	
Working with surds	<ul style="list-style-type: none"> ◆ simplification ◆ rationalising denominators
Simplifying expressions using the laws of indices	<ul style="list-style-type: none"> ◆ multiplication and division using positive and negative indices including fractions ◆ $(ab)^m = a^m b^m$ ◆ $(a^m)^n = a^{mn}$ ◆ $a^{m/n} = \sqrt[n]{a^m}$ ◆ calculations using scientific notation
Rounding to a given number of significant figures	
Working with reverse percentages	Use reverse percentages to calculate an original quantity
Working with appreciation/depreciation	<p>Appreciation including compound interest</p> <p>Depreciation</p>
Working with fractions	Operations and combinations of operations on fractions including mixed numbers (Addition, subtraction, multiplication, division)

Statistical skills The learner will use these statistical skills and apply them in context	
Comparing data sets using statistics	Compare data sets using calculated/determined: <ul style="list-style-type: none"> ◆ semi-interquartile range ◆ standard deviation
Forming a linear model from a given set of data	Determine the equation of a best-fitting straight line on a scattergraph and use it to estimate y given x

Reasoning skills The learner will use mathematical reasoning skills (these can be used in combination or separately)	
Interpreting a situation where mathematics can be used and identifying a strategy	Can be attached to any operational skills to require analysis of a situation
Explaining a solution and relating it to context	Can be attached to any operational skills to require explanation of the solution given

Administrative information

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History of changes to Course Assessment Specification

Version	Description of change	Authorised by	Date
1.1	Further information and clarification on scope and structure of the question papers in the 'Structure and coverage of Course assessment' section; Minor amendment to 'Grading' section	Qualifications Development Manager	June 2013
1.2	Page 5: 'Structure and coverage of the Course assessment' section — reference to the Question Paper Brief added. Page 7 onwards — minor amendments to 'Further mandatory information on Course coverage' section: items split into the same sub-skills which are found in the Unit Specifications and Course and Unit Support Notes (there is no change to the content of the Course assessment).	Qualifications Manager	April 2016

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