

# Comparison document

(Version 1.2 April 2016 compared to previous version)

## National 5 Mathematics Course Assessment Specification (C747 75)

The purpose of this document is to give a quick, visual guide to any amendments or clarifications made during the revision process.

**Valid from August 2013**

This edition: ~~April 2016~~~~June 2013~~, version 1.2

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 Course Assessment Specification can be downloaded from SQA's website: [www.sqa.org.uk](http://www.sqa.org.uk).

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

© Scottish Qualifications Authority 2016

## Course outline

<b>Course title:</b>	National 5 Mathematics
<b>SCQF level:</b>	5 (24 SCQF credit points)
<b>Course code:</b>	C747 75
<b>Course assessment code:</b>	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
<b>Total marks</b>	<b>90 marks</b>

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](http://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.

<b>Algebraic skills</b>	
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"> <li>◆ <math>a(bx+c)+d(ex+f)</math></li> <li>◆ <math>ax(bx+c)</math></li> <li>◆ <math>(ax+b)(cx+d)</math></li> <li>◆ <math>(ax+b)(cx^2+dx+e)</math></li> </ul> where $a, b, c, d, e, f$ are integers $\mathbb{Z}$
Factorising an algebraic expression	<ul style="list-style-type: none"> <li>◆ common factor</li> <li>◆ difference of squares</li> <li>◆ trinomials</li> </ul> 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"> <li>◆ use the formula <math>y-b=m(x-a)</math> or equivalent to find the equation of a straight line, given two points or one point and the gradient of the line</li> <li>◆ use functional notation</li> <li>◆ identify gradient and y-intercept from various forms of the equation of a straight line</li> </ul>
Working with linear equations and inequations	<ul style="list-style-type: none"> <li>◆ numerical coefficients are rational numbers <math>\mathbb{Q}</math></li> <li>◆ numerical solutions are rational numbers <math>\mathbb{Q}</math></li> </ul>
Working with simultaneous equations	<ul style="list-style-type: none"> <li>◆ construct from text</li> <li>◆ graphical solution</li> <li>◆ algebraic solution</li> </ul>
Changing the subject of a formula	<ul style="list-style-type: none"> <li>◆ linear equation</li> <li>◆ equation involving a simple square or square root</li> </ul>
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 ( $\mathbb{Z}$ ). <u>Also,</u> $y=k(x+p)^2+q$ 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 ( $\mathbb{Z}$ ). <u>Also,</u>

	$y = k(x + p)^2 + q$ 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 ( $\mathbb{Z}$ ). <u>Also,</u> $y = k(x + p)^2 + q$ where $k \in \mathbb{Z}$

<u>Working with quadratic equations</u>	<u>factorising</u> <u>graphically</u> <u>using the quadratic formula</u> <u>discriminant</u> <u>roots</u>
<u>Solving a quadratic equation which has been factorised</u>	<u>Solving from factorised form</u>  <u>Graphical treatment</u>
<u>Solving a quadratic equation using the quadratic formula</u>	<u>Solving using the quadratic formula</u>
<u>Using the discriminant to determine the number of roots</u>	<u>Know and use the discriminant</u>  <u>Determine the number or nature of roots</u>

<b>Geometric skills</b>	
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"> <li>◆ quadrilaterals/triangles/polygons/circles</li> <li>◆ relationship in a circle between the centre, chord and perpendicular bisector</li> </ul>
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  <u>Magnitude of a two- or three dimensional vector</u>

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

**Numerical skills**

The learner will use these numerical skills and apply them in context

Working with surds	<ul style="list-style-type: none"> <li>◆ simplification</li> <li>◆ rationalising denominators</li> </ul>
Simplifying expressions using the laws of indices	<ul style="list-style-type: none"> <li>◆ multiplication and division using positive and negative indices including fractions</li> <li>◆ <math>(ab)^m = a^m b^m</math></li> <li>◆ <math>(a^m)^n = a^{mn}</math></li> <li>◆ <math>a^{m/n} = \sqrt[n]{a^m}</math></li> <li>◆ calculations using scientific notation</li> </ul>
Rounding to a given number of significant figures	
<a href="#">Working with reverse percentages</a>	<a href="#">Use reverse percentages to calculate an original quantity</a>
<a href="#">Working with appreciation/depreciation</a>	<a href="#">Appreciation including compound interest</a>

	<u>Depreciation</u>
Working with percentages	<ul style="list-style-type: none"> <li>◆ <del>use reverse percentages to calculate an original quantity</del></li> <li>◆ <del>appreciation including compound interest</del></li> <li>◆ <u>depreciation</u></li> </ul>
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"> <li>◆ semi-interquartile range</li> <li>◆ standard deviation</li> </ul>
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

---

Published: April 2016 (version 1.2)

---

## 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
<a href="#">1.2</a>	<a href="#">Page 5: 'Structure and coverage of the Course assessment' section — reference to the Question Paper Brief added.</a> <a href="#">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).</a>	<a href="#">Qualifications Manager</a>	<a href="#">April 2016</a>

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 specification can be downloaded from SQA's website at [www.sqa.org.uk](http://www.sqa.org.uk).

Note: You are advised to check SQA's website ([www.sqa.org.uk](http://www.sqa.org.uk)) to ensure you are using the most up-to-date version of the Course Assessment Specification.

© Scottish Qualifications Authority 2016