



Common questions about Applications of Mathematics, Mathematics, Mathematics of Mechanics, and Statistics

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National 3 and National 4 Applications of Mathematics and National 4 Mathematics

How should I use practice assessments with candidates?

Where you use practice assessments with candidates, you should consider the degree of similarity between the practice assessment and the summative assessment.

Mathematics — outcome 1 (operational skills)

Summative assessments are likely to be most reliable where they test operational skills using questions set in different contexts or test different aspects of the skill. For some skills, 'changing the numbers' may be the only option, for example factorising a sum of terms with a numerical common factor.

Where a question features a context, then you could change the context, for example Pythagoras' theorem could be in the context of a gate in a practice assessment, then the roof of a house, or context-free in a summative assessment.

Where a question tests a particular aspect of a skill, you could test a different aspect, for example if a Pythagoras' theorem question asked for the hypotenuse in a practice assessment, then the summative assessment could ask for one of the shorter sides instead.

Mathematics — outcome 2 (reasoning skills)

Summative assessments are likely to be most reliable where they attach questions testing reasoning skills to different operational skills or use different contexts or strategies.

Applications of Mathematics

Summative assessments are likely to be most reliable where they test skills using questions set in different contexts. For example, a question on time management may be in the context of cooking in the practice assessment and then planning a journey in the summative assessment.

How many unit assessment support packs using the unit-by-unit approach are there?

For Mathematics and Applications of Mathematics units, we have published one unit assessment support pack using the unit-by-unit approach for each unit. For Numeracy units we developed several unit-by-unit assessments to illustrate different contexts, some of which may be particularly suitable for adult learners.

If candidates don't pass the National 4 Numeracy unit after re-assessment, but pass certain assessment standards, do I need to re-assess these assessment standards at National 3 Numeracy?

If a candidate passes assessment standards in the Numeracy unit at National 4, you do not need to re-assess these assessment standards at National 3 level. You only need to assess the assessment standards that the candidate did not achieve at National 4.

If I use National 4 Applications of Mathematics — package 2: combined approach, is it correct that candidates don't have to do any additional Numeracy tasks?

If you are using a combined approach that covers the Numeracy assessment standards, there is no need to do any additional Numeracy tasks or tests. You just need to track your candidates' achievement.

How should I deal with a situation where candidates taking National 4 Mathematics have been unsuccessful with their National 4 added value unit but have passed the other three units?

If a candidate passes **all** the National 4 Mathematics units apart from the added value unit, they have enough evidence for us to award them a pass in the National 3 Applications of Mathematics course.

We can only certificate candidates for the National 3 Applications of Mathematics course if they are entered for it. The three unit passes at National 4 will also appear on the candidate's Scottish Qualifications Certificate.

If candidates don't pass all of the National 4 Mathematics units, to achieve the National 3 Applications of Mathematics course do they need to sit all of the National 3 unit assessments, or only the tasks in areas that they didn't achieve at National 4?

If they started on the National 4 Mathematics course and are then entered for National 3 Applications of Mathematics instead, any assessment standards they achieved in the National 4 Numeracy unit would overtake the requirements of the National 3 Numeracy unit.

However, candidates need evidence for the assessment standards for the other two Applications of Mathematics units (Manage Money and Data and Shape, Space and Measures) to achieve the National 3 Applications of Mathematics course. Some of this evidence could come from work they have completed at National 4 level for the Expressions and Formulae, Relationships, or Numeracy units, but it is likely they would have to produce additional evidence, for example from classwork.

Can we develop our own assessments for the National 4 added value unit?

Yes, you can develop your own added value unit assessments. We strongly advise getting these prior verified before use with candidates. This is a free service. For more information, please visit SQA's [prior verification](#) page.

In the added value unit tests for Mathematics and Applications of Mathematics, do candidates always have to state the correct units in their answers?

Candidates must state the correct units in most cases.

Where units are not required for candidates to gain full credit, the units appear in brackets in the specific assessment guidelines, for example (£)12.54 or 5.6 (m). This also applies to the bank of additional questions.

In general, candidates should not miss out on marks more than once for equivalent omissions of units in an assessment opportunity.

In the National 4 Mathematics unit assessment support packs it states that, for re-assessment purposes, questions covering assessment standards 2.1 or 2.2 should use different operational skills. Does this mean that we must submit all re-assessments involving these assessment standards to SQA for prior verification?

For assessment standards 2.1 or 2.2, the re-assessments should either be attached to a different operational skill from the same unit (one of the sub-skills as listed in the evidence requirements for each unit and also listed in the 'Judging evidence' table in the unit assessment support packs) or involve the same sub-skill in a different context or require candidates to use a different strategy.

Re-assessments do not need prior verification if they are taking the same basic approach as outlined in any of the unit assessment support packs.

National 5 Mathematics and freestanding SCQF level 5 Mathematics units

In the freestanding SCQF level 5 Mathematics unit assessment support packs it states that, for re-assessment purposes, questions covering assessment standards 2.1 or 2.2 should use different operational skills. Does this mean that we must submit all re-assessments involving these assessment standards to SQA for prior verification?

For assessment standards 2.1 or 2.2, the re-assessments should either be attached to a different operational skill from the same unit (one of the sub-skills as listed in the evidence requirements for each unit and also listed in the 'Judging evidence' table in the unit assessment support packs) or involve the same sub-skill in a different context or require candidates to use a different strategy.

Re-assessments do not need prior verification if they are taking the same basic approach as outlined in any of the unit assessment support packs.

Is rationalising denominators, such as $\sqrt{2} + 5$, included in National 5 Mathematics?

Candidates are only expected to be able to rationalise denominators such as $\sqrt{2}$ as a matter of routine.

When solving inequalities, can candidates leave the variable on the right-hand side in their final answers, for example $4 > x$?

Yes.

Do candidates always need to show an unrounded answer before rounding?

In the freestanding units: yes, but this is not necessary in the question paper. However, it is good practice to show an unrounded answer before rounding. An incorrectly rounded answer in the question paper could mean that candidates miss out on 2 marks if they do not show the unrounded version.

Is $\frac{14}{3}$ an acceptable final answer?

Yes. If a question requires candidates to respond with a mixed number, it will state 'give your answer as a mixed number'.

What is an acceptable level of rounding for a question with no specific rounding requirements?

Generally, answers rounded to three significant figures are appropriate, but candidates should not round their working. They should only round when they have their final answer.

Will the question paper ask candidates to rationalise a denominator with a complex surd?

The question paper will not feature a routine question involving rationalising a denominator with a complex surd. However, the final part of a reasoning question, following on from an earlier part involving finding the product of a complex surd and its conjugate, could involve rationalising a denominator with a complex surd.

Higher Mathematics

What do candidates need to do to get full marks for completing nature tables?

For nature tables, candidates must provide communication appropriate to the context of the question. For example, drawing arrows around one turning point, but ignoring the other turning point may not gain full marks. You can find guidance in past paper marking instructions.

When translating log graphs, do candidates have to draw the asymptote?

Yes, it is important that candidates draw and identify the asymptote.

Higher Applications of Mathematics

What resources do candidates need to complete the question paper?

Electronic files

To complete the question paper, candidates need to access the electronic files supplied by SQA.

Up to 10 minutes before the start of the exam, candidates are allowed to look at page 2 of the question paper to check that they have access to the required electronic files. They must not look at any other pages in the question paper until the exam begins.

Printing

Candidates must print documents during the exam or at the end of the exam.

At the end of the exam, candidates can check that they have printouts for all questions. If they find they are missing printouts, they are allowed time to print.

Freestanding SCQF level 7 Mathematics of Mechanics units

Can candidates achieve the Mathematical Techniques for Mechanics unit if they achieve the Methods in Algebra and Calculus unit?

You can use evidence candidates generate for the freestanding Methods in Algebra and Calculus unit for the freestanding Mathematical Techniques for Mechanics unit.

You should ensure that the evidence meets all the assessment standards.

Assessment standards 1.1, 1.2 and 1.4 in both units are directly equivalent but assessment standards 1.3 are not:

- ◆ A candidate who **has demonstrated competence in all three sub-skills** from Methods in Algebra and Calculus assessment standard 1.3 has generated enough evidence for Mathematical Techniques for Mechanics.
- ◆ You will need to assess a candidate who **has demonstrated competence in two of the sub-skills** on the remaining sub-skill from Mathematical Techniques for Mechanics, 'applying integration to a range of physical situations', before making an assessment judgement.

You must enter and result candidates for each unit separately.

Advanced Higher Statistics

Does my centre need to produce its own Paper-1-style questions for our prelim?

We do not expect you to produce original Paper-1-style questions. Writing these questions takes a lot of time and care to ensure that they have appropriate levels of clarity and emphasis. Therefore, you can base your estimates for your Advanced Higher Statistics candidates solely on their performance in questions typically found in Paper 2.

Prelims and course assessments

What support does SQA offer for prelims?

You can find specimen question papers and past papers on the following subject pages:

- ◆ [National 5 Applications of Mathematics](#)
- ◆ [Higher Applications of Mathematics](#)
- ◆ [National 5 Mathematics](#)
- ◆ [Higher Mathematics](#)
- ◆ [Advanced Higher Mathematics](#)
- ◆ [Advanced Higher Mathematics of Mechanics](#)
- ◆ [Advanced Higher Statistics](#)

Support for marking to standard is available in the 'Course support' tab on the [Higher Mathematics subject page](#). This guidance applies to marking all levels of Mathematics and Applications of Mathematics. You should also refer to the general marking principles in the Mathematics Marking Guidance document, which covers all levels. You can find this document in the 'Related information' section of the [Mathematics subject page](#).

What makes prelims and other centre assessments reliable evidence in terms of candidates' estimated grades?

The closer a prelim or centre assessment is to the standard and format of the SQA course assessment, the more reliable its predictive value. Centre assessments should have a sufficient balance of skills from each area of the course and contain approximately 65% of marks at C level.

What is the difference between C and A content?

Some questions use a stepped approach to ensure that there are opportunities for candidates to demonstrate their abilities beyond level C.

Grade-A candidates typically demonstrate a high degree of accuracy and rigour in their work and can communicate solutions clearly. They produce evidence of applying their knowledge in unfamiliar questions that require a high degree of reasoning and integrate two or more topics.

For questions beyond level C, the context of the question, integration with other skills, and level of communication required in the solution contribute to the additional depth and challenge required for a candidate to demonstrate performance at that level.

The analysis grids from the 2018 and 2019 course assessments are available on the Understanding Standards page of SQA's secure website in the 'NQ unit assessments' tab. These give guidance on the types of questions that are beyond level C.

Can candidates with assessment arrangements in place use calculators in non-calculator papers?

Some candidates may be allowed to use a calculator in the non-calculator papers for Mathematics or Applications of Mathematics as an assessment arrangement. The calculator must be a basic calculator and not a scientific calculator.

A basic calculator should perform the four basic arithmetic operations only and must not have the function to calculate the square root of a number.

Course reports

What are course reports and where can I find them?

Course reports contain valuable information on the performance of candidates in the course assessment. They also contain information on attainment rates.

You can find them in the 'Course reports' section on the following subject pages:

- ◆ [National 5 Applications of Mathematics](#)
- ◆ [Higher Applications of Mathematics](#)
- ◆ [National 5 Mathematics](#)
- ◆ [Higher Mathematics](#)
- ◆ [Advanced Higher Mathematics](#)
- ◆ [Advanced Higher Mathematics of Mechanics](#)
- ◆ [Advanced Higher Statistics](#)

You will find general questions and answers about National Qualifications on our website at www.sqa.org.uk/faq.