Course report 2024

National 5 Mathematics

This report provides information on candidates' performance. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report is intended to be constructive and informative, and to promote better understanding. You should read the report with the published assessment documents and marking instructions.

We compiled the statistics in this report before we completed the 2024 appeals process.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2023: 37,558

Number of resulted entries in 2024: 36,689

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	14,612	Percentage	39.8	Cumulative percentage	39.8	Minimum mark required	64
B	Number of candidates	5,678	Percentage	15.5	Cumulative percentage	55.3	Minimum mark required	54
C	Number of candidates	4,711	Percentage	12.8	Cumulative percentage	68.1	Minimum mark required	45
D	Number of candidates	4,429	Percentage	12.1	Cumulative percentage	80.2	Minimum mark required	35
No award	Number of candidates	7,259	Percentage	19.8	Cumulative percentage	100	Minimum mark required	N/A

We have not applied rounding to these statistics.

You can read the general commentary on grade boundaries in the appendix.

In this report:

- ‘most’ means greater than 70%
- ‘many’ means 50% to 69%
- ‘some’ means 25% to 49%
- ‘a few’ means less than 25%

You can find statistical reports on the statistics and information page of our website.

Section 1: comments on the assessment

The course assessment was accessible to most candidates. Feedback suggested that the course assessment gave most candidates a good opportunity to demonstrate the breadth and depth of their knowledge of National 5 Mathematics.

The question papers largely performed as expected at grade C, were slightly less demanding at grade A, and slightly more demanding at upper A. The grade-A boundary was adjusted to take account of this.

Question paper 1 (non-calculator)

Question paper 1 performed as expected.

Question paper 2

Question paper 2 performed as expected, except for question 12, which proved less demanding than expected and question 16, which proved more demanding than expected.

Section 2: comments on candidate performance

Most candidates attempted most questions.

Most candidates showed their working clearly and stated the correct units, where appropriate.

Question paper 1 (non-calculator)

Question 1: subtract mixed numbers

Most candidates achieved full marks.

Question 2: functional notation

Many candidates achieved full marks.

Most candidates substituted correctly.

There was an equal split between those who carried out the evaluation using BODMAS $(7+3)^2 = 10^2$ and those who expanded brackets $(7+3)^2 = (7+3)(7+3) = 7^2 + 7\times 3 + 7\times 3 + 3^2$.

Where candidates did not achieve full marks, it was usually for $(7+3)^2 = 7^2 + 3^2 = 49 + 9 = 58$ or for making calculation errors in obtaining the individual terms in the expanded version of $(7+3)(7+3)$ or in the addition of the four terms.

Question 3: expand brackets

Most candidates achieved full marks.

Question 4: vector components

Most candidates achieved full marks.

Question 5(a): median and interquartile range

Most candidates achieved 2 or 3 marks in this question, with many candidates achieving full marks. However, a few candidates calculated the mean instead of the median and the SIQR or the range instead of the IQR, but this was not as common as in previous years.

Question 5(b): compare data using medians and interquartile ranges

Many candidates missed out on marks for this question, but responses were better than in previous years. Some candidates achieved full marks.

Typical incorrect responses:

- did not include reference to the prices in the shop and on the website, for example 'on average the website cameras were higher… the shop cameras were more consistent'
- did not state 'on average' in the statement about the median, for example, 'the prices were lower on the website'
- included 'on average' in the statement about the IQR, for example, 'on average the prices were more consistent in the shop'
- simply stated that one median or IQR was higher or lower than the other

Question 7: simultaneous equations

Many candidates achieved full marks. Many candidates scaled the equations very well. Some candidates made calculation errors, mainly due to the negative coefficient when adding or subtracting the scaled equations.

Question 8(a) and (b): interpret trigonometric graph

Most candidates answered both parts correctly. In the few cases candidates missed out on marks, it tended to be in part (b).

Question 10: angle relationships

This question proved more demanding than most questions on this topic from previous years. Only some candidates achieved more than 1 mark.

Common errors included:

- after achieving the first mark and recognising that triangle FOD is isosceles, incorrectly stating that angle = FOD = 55
- assuming that triangle FED is isosceles
- assuming that triangle OFD is equilateral

Most candidates showed working on the diagram. A few candidates only provided working elsewhere on the page without attaching their calculations to named angles and, therefore, did not achieve any marks.

Question 11: find the gradient from the equation of a straight line

Only some candidates achieved any marks for this question.

Many candidates did not rearrange the equation into the form $y = mx + c$.

Some candidates started off with the correct strategy, but did not rearrange the equation correctly.

A few candidates, who obtained the correct rearrangement, stated that the gradient was $-\frac{1}{4}x$.

Question 12(a): complete the square

Many candidates got the correct bracket with the square, but a few candidates did not complete the process correctly.

Question 12(b): find the turning point of a quadratic graph

Although only some candidates gave the correct answer, responses were better than the last time a similar question appeared in a question paper.

Some candidates did not use their answer to part (a) to get the answer to part (b). A few candidates gave an answer of 6, 8 or gave no response to this question.

Question 12(c): interpret a quadratic graph

Some candidates achieved a mark for finding the y coordinate of Q, but few used the turning point from part (b) and symmetry to find the x coordinate of Q. A few candidates did not answer this question.

Question 13: indices

Few candidates achieved more than 1 mark.

Many candidates did not expand the bracket correctly; some attempted to add the two terms inside the bracket; and others, who did attempt to expand the bracket, did not apply the laws of indices correctly.

Many candidates did not add powers, some appeared not to realise that $x = x^1$, and few converted x^0 to 1 in their final answer.

Question 14: similarity

Many candidates missed out on marks in this question.

Many candidates stated a valid scale factor but did not use it within a valid strategy. Some candidates did not calculate $\frac{3}{7}$ of 10 correctly. A few candidates used Pythagoras' theorem, despite the triangles not being right-angled.

Question paper 2

Question 1: depreciation

Most candidates achieved full marks. If candidates did not achieve full marks, it was often due to them rounding money inappropriately. For example:

- rounding the final answer to £186.4
- using a year-by-year approach and prematurely rounding, resulting in a final answer that differed significantly from the correct answer

Question 2: scientific notation calculation

Many candidates achieved full marks.

Most candidates achieved the first mark, but a few did not gain the second mark due to giving the final answer as 305000000 or 305×10^{6}. A few candidates unnecessarily wrote 1.22×10^{6} in full, which led to errors in their later working.

Question 3: cosine rule

Most candidates achieved at least 2 marks. Many candidates achieved full marks.

Common errors included calculating the angle at B or the angle at C and disregarding the negative in $\frac{-207}{900}$ leading to an answer of 77°.

Question 4: linear inequation

Many candidates achieved at least 2 marks. Some candidates achieved full marks.

Many candidates missed out on the final mark due to:

- not reversing the direction of the inequality sign
- not moving the term in x to the right-hand side of the inequation
- incorrectly processing negative numbers

Question 5: reverse percentage

Many candidates achieved full marks.

A few candidates calculated 84% or 16% of £460, but this was less of an issue than in previous years.

Question 6(a): factorise a quadratic expression

Many candidates achieved full marks, but some candidates did not identify the common factor and applied an inappropriate method for factorising the expression leading to two brackets. For example, $(y+2)(y-3)$ was a common incorrect answer.

Question 9: change of subject

Most candidates achieved at least 2 marks. Many candidates achieved full marks.

Where candidates missed out on marks, $f-3=\frac{2d}{e}$ was often an incorrect first step.

Question 13: sine rule followed by right-angled triangle trigonometry

Some candidates achieved 3 marks or more, but some candidates did not gain any marks. Some calculated the length of AB or BC, or the lengths of both AB and BC but did not make any valid progress from there. Some candidates stopped after calculating either or both of these lengths.

Of the candidates who continued correctly:

- some used the sine rule again rather than using SOHCAHTOA
- a few used strategies that were more complex than required, for example after calculating AB, they used the sine rule in triangle ABD to find AD and then used Pythagoras' theorem to find BD

Question 14(a) and (b): 2D vector pathways

In part (a), many candidates gave the correct answer, but a common incorrect response was $\mathbf{a}-\mathbf{b}$ instead of $\mathbf{b}-\mathbf{a}$. A few candidates did not give a response to part (a).

Many candidates missed out on marks in part (b). Part (b) had more no responses from candidates than part (a).

Some candidates achieved the first mark, but few candidates gained the second mark as they either simplified their answer incorrectly or did not attempt to simplify it. Many candidates did not collect like terms, with few candidates able to deal with $-\mathbf{a}-\frac{1}{2}\mathbf{a}$ correctly.

Question 15: find area of sector of circle given arc length

Although many candidates missed out on marks for this question, some candidates achieved full marks.

Many candidates used method 2, but some did not rearrange their equation to find the correct angle at the centre of the circle. A few candidates who used method 2 appear to have guessed the size of the angle at the centre or obtained it by using an invalid strategy like the cosine rule.

Fewer candidates used the more efficient method 1, but it was noticeable that these candidates were more successful in finding the correct answer.

Question 16: trigonometric identity

This question proved more demanding than expected. Very few candidates achieved any marks and the number gaining some marks was less than in previous years.

Very few candidates identified the substitution that eliminated the $\cos^2 x$ term. A few candidates started with $3\cos^2 x - \left(\sin^2 x + \cos^2 x\right)$ or $3\cos^2 x - \sin^2 x + \cos^2 x$ but did not subsequently eliminate the $\cos^2 x$ term.

Section 3: preparing candidates for future assessment

The following advice may help prepare future candidates for the National 5 Mathematics course assessment:

- Candidates should maintain and practise number skills to prepare for the non-calculator question paper. In question paper 1, performance in number skills showed some improvement from previous years, but too many candidates miss out on valuable marks because they do not demonstrate the necessary basic number skills.
- Candidates should maintain and practise basic algebraic skills. For example, rearranging, factorising and simplifying. In both question papers, performance in basic algebraic skills costs some candidates valuable marks.
- Candidates should maintain and practise previously acquired skills. For example, it appeared that some candidates were unable to recall the formula for the volume of a cuboid in question 7 from paper 2.
- Candidates should maintain and practise the problem-solving skills that they need to tackle questions that assess reasoning.
- Candidates should practise questions that require them to compare data sets, for example, question 5(b) in paper 1. The marking instructions contain examples of acceptable and unacceptable comments.
- Where questions involve angles in a diagram, encourage candidates to note the sizes of any angles they calculate in the relevant place on the diagram. Markers are unlikely to award marks to calculations candidates do elsewhere on the page that are not clearly attached to any angle(s).
- Encourage candidates, when sketching a right-angled triangle, to clearly label the right angle. For example, some candidates missed out on a mark in question 10 in paper 2 for not clearly identifying which angle was a right angle in their diagram.
- Consider teaching working with quadratic graphs of the form $y = (x + a)^2 + b$ along with completing the square. Many candidates did not link these skills in questions 12(a) and 12(b) in paper 2.
- Encourage candidates to avoid inappropriate premature rounding that leads to incorrect answers. For example, some candidates missed out on a mark in question 13 in paper 2 for responses like the one shown in note 3 of the marking instructions.
- Encourage candidates to use efficient methods to answer questions. For example, candidates who started question 2 in paper 1 with $(7+3)^2 = 10^2$ and question 15 in paper 2 with $\frac{\text{sector}}{\pi \times 12^2} = \frac{15}{\pi \times 24}$ had more success in obtaining the correct answers than those who used less efficient methods.

Teachers and lecturers delivering the National 5 Mathematics course, and candidates taking the course, should consult the detailed marking instructions for the 2024 question papers on SQA's website. The website also contains the marking instructions from previous years.

Appendix: general commentary on grade boundaries

SQA's main aim when setting grade boundaries is to be fair to candidates across all subjects and levels and maintain comparable standards across the years, even as arrangements evolve and change.

For most National Courses, SQA aims to set examinations and other external assessments and create marking instructions that allow:

- a competent candidate to score a minimum of 50% of the available marks (the notional grade C boundary)
- a well-prepared, very competent candidate to score at least 70% of the available marks (the notional grade A boundary)

It is very challenging to get the standard on target every year, in every subject, at every level. Therefore, SQA holds a grade boundary meeting for each course to bring together all the information available (statistical and qualitative) and to make final decisions on grade boundaries based on this information. Members of SQA's Executive Management Team normally chair these meetings.

Principal assessors utilise their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. SQA can adjust the grade boundaries as a result of the discussion at these meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper or other assessment has been more, or less, difficult than usual.

- The grade boundaries can be adjusted downwards if there is evidence that the question paper or other assessment has been more difficult than usual.
- The grade boundaries can be adjusted upwards if there is evidence that the question paper or other assessment has been less difficult than usual.
- Where levels of difficulty are comparable to previous years, similar grade boundaries are maintained.

Every year, we evaluate the performance of our assessments in a fair way, while ensuring standards are maintained so that our qualifications remain credible. To do this, we measure evidence of candidates' knowledge and skills against the national standard.

During the pandemic, we modified National Qualifications course assessments, for example we removed elements of coursework. We kept these modifications in place until the 2022–23 session. The education community agreed that retaining the modifications for longer than this could have a detrimental impact on learning and progression to the next stage of education, employment or training. After discussions with candidates, teachers, lecturers, parents, carers and others, we returned to full course assessment for the 2023–24 session.

SQA's approach to awarding was announced in March 2024 and explained that any impact on candidates completing coursework for the first time, as part of their SQA assessments, would be considered in our grading decisions and incorporated into our well-established

grading processes. This provides fairness and safeguards for candidates and helps to provide assurances across the wider education community as we return to established awarding.

Our approach to awarding is broadly aligned to other nations of the UK that have returned to normal grading arrangements.

For full details of the approach, please refer to the National Qualifications 2024 Awarding — Methodology Report.