



Course Report 2014

Subject	Mathematics
Level	National 5

The statistics used in this report have been compiled before the completion of any Post Results Services.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the examination.

Section 1: Comments on the Assessment

Summary of the Course assessment

The course assessment was found to be accessible to the vast majority of candidates.

Feedback suggested that it was set at a level similar to Intermediate 2 and Credit Level, and gave candidates a good opportunity to demonstrate the spread and depth of their knowledge of the subject at this level. It was a good reflection of what had appeared in model and practice papers.

The course assessment performed as expected except for Question 13 in Paper 1, which candidates found more difficult than was intended. This affected the stronger candidates less than the others.

Section 2: Comments on candidate performance

Summary of the Candidate Performance

The mean mark for Paper 1 was 20.6 out of 40 ie 51.5%. The mean mark for Paper 2 was 32.4 out of 50 ie 64.8%. The mean mark overall was 53 out of 90 ie 58.9%.

- ◆ The majority of candidates made a good attempt at all questions apart from questions 10, 11(b) and 13 in Paper 1 and question 11 in Paper 2.
- ◆ Some candidates scored very high marks. Others however, scored very low marks and were perhaps inappropriately presented at this level.
- ◆ Most candidates wrote clearly, showed all appropriate working and stated correct units for their answers where appropriate.
- ◆ The number of candidates who failed to achieve full marks in some questions in Paper 1 because of an inability to carry out straightforward calculations was disappointing.

Section 3: Areas in which candidates performed well

Paper 1

- ◆ Question 1: **Multiply a fraction by a mixed number.** Most candidates multiplied correctly but some were unable to give the answer in its simplest form.
- ◆ Question 2: **Expand brackets.**
- ◆ Question 3: **Complete the square.** Most candidates gave the correct value for a , but some gave an incorrect value for b .
- ◆ Question 4: **Using components to find the resultant of two three-dimensional vectors.**

- ◆ Question 7: **Find the value of a in the quadratic function $y = ax^2$.** Most candidates substituted correctly for x and y in the equation but some were unable to find the correct value for a .
- ◆ Question 8: **Reverse use of percentage.** Performance in this type of question is improving. Most candidates scored full marks, but there were still a significant number who simply worked out 80% of 480000 or 480000 plus 20% of 480000.

Paper 2

Question 1: **Depreciation.** Most candidates scored full marks but a significant number used an inefficient method.

Question 3: **Construct and solve simultaneous equations.** Most candidates scored full marks but some did not achieve the final mark in 3(c), which required them to correctly communicate the answer to the question. Some stopped when they got to $a=22.5$ and $c=15.25$, rather than continue to give an answer of eg an adult ticket cost £22.50 and a child ticket cost £15.25.

Question 4(a): **Calculate mean and standard deviation of a data set.**

Question 5: **Volumes of similar shapes.** Nearly all candidates found the correct linear factor; most then continued to calculate the correct answer, but some simply multiplied 750 by the linear factor.

Question 6: **Converse of Pythagoras' Theorem:** Most candidates scored three of four marks in this question. Where marks were dropped it was usually for poorly communicated responses, eg for not stating explicitly that $110^2 \neq 85^2 + 75^2$, so the triangle is not right-angled etc.

Question 7: **Volume of a composite solid involving a cone and a hemisphere.** Most candidates scored three or more marks in this question. Where marks were dropped it was usually for incorrect rounding (the final answer was often rounded to two decimal places rather than two significant figures), using an incorrect radius for the cone and/or the hemisphere, or finding the volume of the sphere and then not halving it.

Section 4: Areas which candidates found demanding

Paper 1

Question 5: **Sine Rule.** A common error was to use $\sin 0.4$ and $\sin 0.9$ instead of 0.4 and 0.9. Many candidates were unable to work out

$$\frac{18 \times 0.4}{0.9}$$

correctly.

Question 6 (a): **Equation of Straight Line.** Most candidates found the correct gradient but some did not know how to progress from there. Many did not gain the final mark because they did not give their final equation in terms of F and C and/or did not simplify it.

$y=15x+125$ was a common answer, which gained 2 of the 3 available marks.

Question 6 (b): **Calculate a value using the equation of straight line.** A high number of candidates were unable to work out 15×40 correctly.

Question (10): **Trigonometric graph.** Some candidates gave the correct value for a , but very few gave the correct value for b .

Question 11 (a): **Find the gradient of a straight line given its equation.** Most candidates started to rearrange the equation but didn't divide by 3 correctly.

Question 11 (b): **Find the x-intercept of a straight line given its equation.** A surprising number of candidates did not know to substitute $y=0$ into the original equation. Many candidates who did substitute $y=0$ were then either unable to solve the resulting equation correctly or left their answer as $x=3$ instead of giving the coordinates of the point where the line crossed the x -axis.

Question 13: **Quadratic Equation Problem.** Most candidates scored few marks for this question. Many candidates thought that $h(t)$ meant $60t$ and started with $60t=16t-t^2$ leading to $60=16-t$ leading to $t=-44$. Some candidates started with $60=16t-t^2$ but were unable to go any further. Few candidates gave a correct response. Successful responses tended to be using trial and error methods as opposed to solving a quadratic equation.

Question 13: **Quadratic Equation Problem.** Few candidates used a suitable strategy or gave an appropriate justification for their answer. Very few realised the significance of the turning point. Some set up a quadratic equation but thought that because it wouldn't factorise it had no roots. Many candidates used a substitution method for both parts of this question.

Paper 2

Question 2: **Three dimensional coordinates.** This question proved to be challenging for many.

Question 4 (b): **Interpret Statistics.** Although performance in this type of question is improving, many candidates still do not understand that standard deviation is a measure of consistency.

Question 8: **Simplify an expression involving indices.** Most candidates managed to cancel the constants, but many did not correctly deal with the indices. $5n^3$ was a common answer.

Question 9: **Subtract algebraic fractions.** Many candidates gained the first two marks but failed to subtract correctly for the third mark. A final numerator of $4x + 15$ was common.

Some candidates arrived at the correct answer and then proceeded to cancel an x on the numerator with an x on the denominator.

Question 10 (b): **Calculate the size of an angle.** Many candidates did not realise that angle ABN was 120 degrees. A common response was to divide the answer to part (a) by 2 then subtract from 180 degrees.

Question 11: **Change the subject of a formula.** This question was poorly attempted. Candidates made a variety of confused responses, particularly in trying to deal with the t^2 . Many divided by t and then found the square root. Some thought that the square applied to the a as well as the t . Many candidates did not multiply all terms by 2 when dealing with the $\frac{1}{2}$; many did not multiply by 2 at all. Some treated the ut term and the $\frac{1}{2}$ in the same way.

Question 13: **Calculate the area of a composite shape involving a sector of a circle and a triangle.** There were a variety of responses to this question. The majority picked up some or all of the marks but many candidates only calculated the area of the triangle or the area of one of the sectors. Some used $A = \frac{1}{2}bh$ to calculate the area of the triangle after having used laborious methods to calculate the base and height.

Section 5: Advice to centres for preparation of future candidates

Centres deserve credit for the preparation of candidates for the National 5 Mathematics course assessment. Candidates were well-prepared in dealing with most questions and working was usually displayed clearly.

The following advice that may help candidates pick up more marks:

- ◆ A mark is available for **stating correct units** in one question in the course assessment. Candidates should state the correct units for their answers to all appropriate questions to ensure that they gain full credit in the question in which the mark for units is available.
- ◆ In **Paper 1**, poor number skills cost many candidates valuable marks. Centres should consider how best to maintain and practice number skills in preparation for the non-calculator paper in the course assessment.
- ◆ When finding the **equation of a straight line**, candidates at this level should give the equation in its simplest form in terms of the given variables, eg $C = 15F + 125$.
- ◆ Centres should note that the use of **functional notation** is not restricted to linear functions.
- ◆ In questions that involve **angles in a diagram**, candidates should write the sizes of any angles they use, in the diagram. This allows the marker to follow the candidate's working, and increases the opportunity for marks to be awarded.
- ◆ Centres should consider how best to practise problem solving skills, which candidates require to tackle questions which involve some **reasoning** in the course assessment.

The SQA website contains the Marking Instructions for the 2014 course assessment. All those teaching National 5 Mathematics, and candidates undertaking the course, will find further advice and guidance in these detailed Marking Instructions.

Statistical information: update on Courses

Number of resulted entries in 2013	0
------------------------------------	---

Number of resulted entries in 2014	22536
------------------------------------	-------

Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 90				
A	36.3%	36.3%	8171	62
B	18.6%	54.9%	4200	52
C	15.7%	70.6%	3536	43
D	7.1%	77.7%	1597	38
No award	22.3%	-	5032	-