Exemplar Question Paper for Higher Mathematics

The Exemplar Question Paper and Marking Instructions have been developed to be used by centres and candidates to prepare for question papers (exams) as part of Higher Course assessment. They show how questions from past papers can be used or amended to support learners in their exam preparation.

The structure of the Exemplar Question Paper is aligned with the guidance in the Course Assessment Specification, which is available on the subject page (at www.sqa.org.uk/browsecfesubjects).

The questions in the Exemplar Question Paper follow the style and structure of similar questions in the Specimen Question Paper (also available on the subject page). The paper overall is designed to provide the same level of demand as the Specimen Question Paper; and the Detailed Marking Instructions reflect the approach of those in the Specimen Question Paper.

The questions included in the Higher Exemplar Question Paper were, as far as possible, selected or amended from those used in past papers, in accordance with the Guidance on the use of past paper questions document. Care has been taken to align the information in the table below with the questions identified in the guidance document and used in the Exemplar Question Paper. Any misalignment in this information will be updated as part of our regular revisions in 2015.

If no suitable questions were available in recent past papers for reasons of sampling or because there is now new content, new questions were developed or appropriate questions were selected/adapted from other years. Details of how questions have been amended for this Exemplar Question Paper are given in the table below.

When using any past paper questions, it is important to remember that centres and candidates must take into account the generic guidance on selection and/or amendments to questions below.

- You must select questions that provide the learners with the same level of challenge as those in the Higher Specimen Question Paper.
- You may be able to use questions as published or with amendments as suggested in the columns below.
- You must use questions that adhere to the Higher General Marking Principles and reflect the form of Detailed Marking Instructions as published in the Higher Specimen Question Paper.

If any change to a question/items is necessary, you must ensure that:

- the style and structure matches the Specimen Question Paper for Higher
- marking of the learner's response to the question adheres to the General Marking Principles in the Higher Specimen Question Paper
- Marking Instructions are amended to reflect the style of the Higher Detailed Marking Instructions

Additional Subject Specific Information for Higher Mathematics

The table below shows which questions in the Exemplar Question Paper were selected/amended from past papers (and in what way they were amended) — in accordance with the **Guidance on the use of past paper questions for Higher** document — and also lists any new questions.

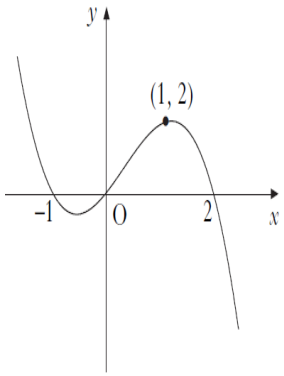
The Exemplar Question Paper for Higher can be found on the subject page.

To fully reflect Curriculum for Excellence principles and to produce a balanced paper, it has been necessary to write new questions. Objective test questions have also been adapted to short response questions.

Glossary of terms

Term	Explanatory comment
Question used as published in past paper	Past paper question has been used as previously published.
Past paper question with context amended	Past paper question has been used, but basis of the information has altered, eg in Geography, this may mean a change in context from glaciation to coasts.
Past paper question with source amended	Past paper question has been used, but source of information is different, eg in English this may mean a different text has been used.
Past paper question with style amended	Past paper question has been used, but style of questioning has changed, eg in Mathematics, multiple-choice questions may have been changed to a short response question.
Past paper question with structure amended	Past paper question has been used but the structure of the question has changed, eg in Physics it may mean only part of question was used with amendments to Marking Instructions to take account of no half marks.
New question written	This is a new area of Course content.

PAPER I

Higher Exemplar question number	Question used as published in past paper, with or without amendment to Marking Instructions	Past paper question with context amended	Past paper question with source amended	Past paper question with style amended	Past paper question with structure amended	New question written
1				**2013 Paper I, Q2** Remove first line of question and change to: What is the equation of the tangent to the curve $x^2 - 4x + 7$ at $x = 5$? MI rewritten accordingly.		
2				**2011 Paper I, Q17** Stem changed as follows, also diagram edited: 		

				The diagram shows curve with equation $y = f(x)$ where $f(x) = kx(x+a)(x+b)$ The curve passes through the points (-1, 0), (0, 0) and (2, 0) and (1, 2). The equation of the cubic is of the form 'Find the values of, a , b and k'. MI rewritten accordingly.		
3				**2012 Paper I Q14** Changed to definite integral Evaluate $\int_0^2 \frac{1}{6}x^{-2}dx$ to complement Specimen Question Paper. MI rewritten accordingly.		
4				**Qs 12 Paper I 2012** Changed from multiple-choice questions to justify your answer response. MI rewritten accordingly.		

5					**2011 Paper II Q2(c), 2011 Paper I Q7, 2014 Paper I Q22** Question stem adjusted to include determining coefficients of polynomial. MI rewritten accordingly.	
6	**2012 Paper I Q23** MI used as is.					
7	**2011 Paper I Q23** MI used as is.					
8					**2012 Paper II Q4 to 6** Marks solely based upon candidate sketching derived function. Q4(a) now is reflecting in x axis and vertical shift. 2011 Paper II Q4(b) changed from $h'(x)$ to $h(x)$ to enable candidates to still access 3 marks if they have been unable to gain 3 marks in part (a).	

9	**2012 Paper I Q22** Amended to include multiple angles $\cos 4x - \sqrt{3}\sin 4x$ MI rewritten accordingly.					
10						New question and MI written to address solving differential equations of the form $\frac{dy}{dx} = f(x)$ which was not in Specimen Question Paper.
11	**2011 Paper II Q2(a)** used as is. Existing function question provides Q11(a).					Q11(b) New question written to address new content — inverse functions. New MI written.

PAPER II

Higher Exemplar question number	Question used as published in past paper, with or without amendment to Marking Instructions	Past paper question with context amended	Past paper question with source amended	Past paper question with style amended	Past paper question with structure amended	New question written
1	**2011 Paper II Q3** Use as is. MI used as is.					
2	**2012 Paper II Q2** Question and MI used as is.					
3						Quadratic question written to allow for use of discriminant given nature of roots.
4	**2013 Paper II Q4** MI amended — candidates not asked for coord proof. 1 mark removed.					
5					**2011 Paper II Q1** Based upon a square-based pyramid. Diagram to be changed as	

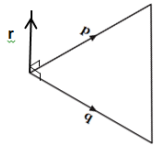
					shown. However, question stem changed to include two strands not covered in Specimen Question Paper: 1. Determine resultant of vector pathway in 3D. 2. Use unit vectors $\mathbf{i}, \mathbf{j}$ and $\mathbf{k}$ as a set of basis vectors. MI rewritten accordingly.	
6				**2011 Paper I Q14** Stem changed to include vector $\mathbf{r}$ perp. to original vectors  stem now: Vectors **p** and **q** are represented by two sides of an equilateral triangle of side 3 units as shown in the		

				diagram. Vector **r** is 2 units long and is perpendicular to both **p** and **q.** Calculate the scalar product **p.(p+q+r)**. Similar question to 2005 Paper II Q10.		
7					**2013 Paper II Q9(b)** Changed to include a condition and justification. MI rewritten accordingly.	
8					**Based on 2013 Paper II Q6** Stem changed to include integration of the form: $f(x) = \text{psin}(\text{q}\,x + \text{r})$ becomes: $\int_{\frac{\pi}{8}}^{a} 5\sin\left(4x - \frac{\pi}{2}\right)dx = \frac{10}{4}$ providing more challenge.	
9					**2013 Paper II Q7** Use as is except part (a) removed, part (b) becomes	

					part (a) and new part (b). Question stem reworded to include a requirement to justify answer. MI rewritten accordingly.	
10	**2014 Paper II Q9** Used as is. MI used as is. Use of calculus in a context.					