Examiners' Report/
Principal Examiner Feedback

June 2011

GCE Further Pure Mathematics FP2 (6668)
Paper 1

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information, please call our GCE line on 0844 576 0025, or visit our website at www.edexcel.com.

If you have any subject specific questions about the content of this Examiners' Report that require the help of a subject specialist, you may find our **Ask The Expert** email service helpful.

Ask The Expert can be accessed online at the following link:
http://www.edexcel.com/Aboutus/contact-us/

June 2011
Publications Code UA027967

Further Pure Mathematics Unit FP2
Specification 6668

Introduction

Candidates found the paper accessible and displayed a good deal of technical skill. They showed familiarity with and appreciation of the topics tested and standard methods were well known and often accurately applied.

The quality of presentation was generally good with solutions showing logical steps making the work easy to follow. The questions that proved most challenging were the latter parts of question 5 and questions 7 and question 8.

Report on individual questions

Candidates found the paper accessible and displayed a good deal of technical skill. They showed familiarity with and appreciation of the topics tested and standard methods were well known and often accurately applied.

The quality of presentation was generally good with solutions showing logical steps making the work easy to follow. The questions that proved most challenging were the latter parts of question 5 and questions 7 and question 8.

Report on individual questions

Question 1

Candidates used a great number of approaches to this question, often missing one or more of the critical values. The most successful solutions used the given forms and then a graph sketch was drawn with critical points identified. Others manipulated the expressions in various ways and attempted to find the solutions of higher order equations and used appropriate tables or graphs to determine the correct final intervals. Weaker candidates simply cross-multiplied, sketched a quadratic and missed two of the critical values.

Question 2

There were typically two approaches to part (a): Candidates either differentiated the expression as presented or multiplied out the brackets first. The awkwardness of differentiating triple terms confused some as did the plethora of similar terms. Most candidates overcame these difficulties, but the incorrect answer $k = 2$ was common.
Part (b) was routine for most, with only a small number giving f(0) the x value 0.

Question 3

Most candidates were well prepared and calculated the correct integrating factor and used it effectively. A few candidates omitted to divide through by x and others could not deal with $e^{5 \ln x}$. Integration by parts was almost always recognised and usually done well. A few candidates forgot to include a constant of integration and lost marks for their final answer

Question 4

This was another well practised and executed question. Parts (a) and (b) were routinely completed. Most candidates multiplied out the brackets and many took the more efficient binomial route. In part (c) the standard use of a list to illustrate how all but the end terms cancelled was well understood by almost all. A very small number rewrote the terms and corresponding limits to achieve the same result and this was usually well done. The main problem encountered by candidates was the 2 in the summation. All too often the summation was forgotten and 2 rather than $2n$ was used.

Question 5

Parts (a) and (b) were straight forward for the majority of candidates, but part (c) turned out to be a serious challenge for many. There were a wide variety of possible approaches, but the most common error was the assertion that the imaginary part of z was zero rather than that of w. Many candidates automatically inverted the relationship to express z in terms of w, a step which could be developed but was not a necessary move. Some candidates found concise ways to prove the result; others displayed their ability to handle substantial algebraic manipulations. Unfortunately, many floundered, trying various approaches only to abandon them.

Question 6

The general approach was well known and the question was often well done. Nearly all candidates readily identified the required angle, quoted the area under a curve and made good progress. The use of a double angle formula was well known, but there were occasional slips. Sometimes candidates miscalculated the area of the triangle and failing to explain their approach, or showing sufficient detail to make it plain, lost credit for their efforts. Most saw the need to find the area of the triangle and subtract it but a few did not.

Question 7

Part (a) was generally done well and presented clearly. Expanding the binomial was usually well done and many identified the imaginary parts, equated and established the conclusion. Weaker candidates thought they had to equate real parts and some struggled with the algebra with numerous slips in their attempt. In part (b) a significant minority ignored the factor of 5 in the given equation and so made limited progress. Unfortunately the solutions from negative roots as well as 0 and π were often overlooked.

Question 8

Stronger candidates found part (a) routine and often made good progress. However, some got their variables mixed up in the complementary function and others got the wrong sign on the power of *e*. Most stated the correct standard form of the particular integral and completed the necessary calculations successfully to find their coefficients. A common error was then to ascribe them to the wrong trigonometric term. Part(c) was a challenge to the majority of candidates and was rarely completed successfully even by otherwise capable candidates.

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email publication.orders@edexcel.com
Order Code UA027967 June 2011

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning