FSMQ

Foundations of Advanced Mathematics (MEI)

Combined Mark Scheme
And Report on the Unit

June 2006

OCR (Oxford, Cambridge and RSA Examinations) is a unitary awarding body, established by the University of Cambridge Local Examinations Syndicate and the RSA Examinations Board in January 1998. OCR provides a full range of GCSE, A level, GNVQ, Key Skills and other qualifications for schools and colleges in the United Kingdom, including those previously provided by MEG and OCEAC. It is also responsible for developing new syllabuses to meet national requirements and the needs of students and teachers.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2006

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annersley
NOTTINGHAM
NG15 0DL

Telephone: 0870 870 6622
Facsimile: 0870 870 6621
E-mail: publications@ocr.org.uk

CONTENTS

Foundations of Advanced Mathematics FSMQ (6989)

MARK SCHEME AND REPORT ON THE UNIT

Mark Scheme and Report on the Unit
June 2006

Foundations of Advanced Mathematics – 6989

There were 676 entries for this session, slightly more than last year. The mean mark was 21, which is one down on the last two years. The minimum mark scored by one candidate was 5 and the maximum mark scored was 39 (so no one achieved full marks this year).
There were 16 questions for which at least one candidate offered no answer, rather more than usual, and this included practically every one of the last few questions. This, together with the mean mark being down, might indicate that candidates found the paper rather more difficult than previous cohorts.

In all questions at least one candidate offered each of the distracting answers.

In 7 questions the wrong answer was offered by more candidates than the right answer and this was rather more than usual. It is worth noting that in all cases where a clear majority gave the incorrect answer, that incorrect answer was before the correct answer. (In the two cases where this was not true the difference in percentages was only 1%). I wonder if this indicates that when candidates think they have found the incorrect answer they do not bother with the other responses. This is, of course, to be discouraged. All responses should be considered to enable the candidate to be clear on which is the correct answer.

Q15 (Simplification of algebraic expression). The most popular answer here (36%) was from candidates who failed to pick up that taking away a negative value is equivalent to adding the positive value.

Q16 (Rearranging formulae). Both formulae involved a square root, one removing it and one inserting it. Both rearrangements were correct, but 37% thought that the rearrangement of the formula for the volume of a cone was incorrect.

Q20 (Scales and models). The answer that was wrong was D which took the volume of the model (answer B - correct) and multiplied it by the scale factor of 76. In fact to get the volume you should multiply by the cube of the scale factor. Since the majority (49%) had already decided that C was incorrect maybe most did not get to D. The diagrams gave a side view, end view and plan. To find the perimeter of the base of the house it was necessary to add the lengths of the end view, the side view, double and then multiply by the scale factor. I wonder if candidates added in addition the third length, being the length of the plan on the third diagram.

Q27 (Angles in range $[0^0, 360^0]$) An angle with a negative sin and positive cos has to be in the fourth quadrant. Most candidates (39%) gave the angle in the first quadrant . It may be that candidates inputted invsin(-0.6) obtaining -36.9^0 and chose for some reason to ignore the negative sign.

Q29 (Vectors) Again the majority of candidates (38%) decided that C was incorrect (maybe because they did not understand the concept of an angle of 135^0 with the positive *x* axis) and so it may be that none of them progressed to look also at response D.

Q35 (Trigonometry of right-angled triangles) The first triangle required the check of a cos ratio. Presumably most candidates then thought that the second was a check of a sin ratio which is wrong. So presumably they thought it correct while it was in fact wrong. Maybe they then put down D

having discovered that C was also incorrect. In addition, D was the "odd one out" in not having an angle to check but was a check on Pythagoras.

Q37 (Sine and Cosine Rules) Response C was the incorrect answer which was based on an incorrect formula, $a^2 = b^2 + c^2 - bc\cos\theta$ but only 36% recorded this response. 37% decided that response D was the incorrect one - application of the sine rule using the incorrect value for RS (as stated in response C) would make this angle wrong.

In this session the variation of responses was much wider, though 2 questions obtained a 90% correct response rate and question 31 (Pictogram) managed the best this time with 94% getting it right.

As in previous sessions I offer a summary of questions and topics with the approximate percentage of candidates giving the correct responses. As noted in previous reports, the giving of the correct response may not be because the candidate understands the question and can discern the errors being made in the distracting responses. Attempts are made not to offer distractors in such a way that the correct response is clearly different to the rest, but our perception of typical errors might result in that happening.

	Question	Topic
91 – 100%	31	Pictogram
81 – 90%	2	Arithmetic
	24	Distance-Time graph
	28	Algebra
71 – 80%	4	Arithmetic equivalences
	6	Standard form
	9	Algebraic substitution
	14	Quadratic factorisation
61-70%	1	Rounding numbers
	8	Solving an equation
	10	Reasonable units
	11	Expansion of brackets
	26	Gradients of lines
	30	Interpretation of chart
51 –60%	3	Arithmetic
	5	Multiplication of mixed numbers
	18	Speed-time graph
	23	Quadratic sequence
	25	Vectors
41 – 50%	7	Algebra
	13	Inequalities
	17	Algebra
	19	Cumulative frequency
	21	Arithmetic
	32	Standard form
	34	Error bounds
	38	Interpretation of bar chart
	39	Probability
31 – 40%	12	Solution of quadratic equations
	22	Algebra
	33	3_D trigonometry
	35	Trigonometry
	36	Gradient of curve
	37	Sine and cosine rules
	40	Solution of cubic equations
21 – 30%	15	Simplification of algebraic fractions
	16	Rearrangement of formulae
	20	Scale models
	27	Trigonometry - angles greater than 90^0.
	29	Vectors

Answers.

1	C	21	B
2	C	22	D
3	B	23	C
4	B	24	D
5	D	25	A
6	C	26	B
7	B	27	B
8	A	28	A
9	C	29	D
10	A	30	B
11	D	31	D
12	D	32	D
13	B	33	D
14	A	34	C
15	A	35	B
16	D	36	D
17	D	37	C
18	B	38	C
19	C	39	C
20	D	40	C

FSMQ Intermediate Foundations of Advanced Mathematics(FAM)
June 2006 Assessment Series

Unit Threshold Marks

Unit	Maximum Mark	A	B	C	D	E	U
6989	40	30	26	22	18	15	0

The cumulative percentage of candidates awarded each grade was as follows:

	A	B	C	D	E	U	Total Number of Candidates
6989	11.5	23.4	46.6	70.3	84.0	100	676

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Information Bureau

(General Qualifications)
Telephone: 01223 553998
Facsimile: 01223 552627
Email: helpdesk@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance
programme your call may be recorded or monitored