

Wednesday 30 May 2012 – Afternoon

FSMQ ADVANCED LEVEL

6993 Additional Mathematics

PRINTED ANSWER BOOK

Candidates answer on the Printed Answer Book.

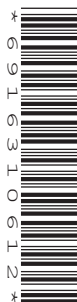
OCR supplied materials:

- Question Paper 6993 (inserted)

Other materials required:

- Scientific or graphical calculator

Duration: 2 hours



Candidate forename						Candidate surname					
Centre number						Candidate number					

INSTRUCTIONS TO CANDIDATES

These instructions are the same on the Printed Answer Book and the Question Paper.

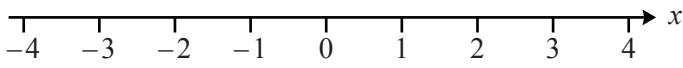
- The Question Paper will be found in the centre of the Printed Answer Book.
- Write your name, centre number and candidate number in the spaces provided on the Printed Answer Book. Please write clearly and in capital letters.
- **Write your answer to each question in the space provided in the Printed Answer Book.** Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Do **not** write in the bar codes.
- You are permitted to use a scientific or graphical calculator in this paper.
- Final answers should be given correct to three significant figures where appropriate.

INFORMATION FOR CANDIDATES

This information is the same on the Printed Answer Book and the Question Paper.

- The number of marks is given in brackets [] at the end of each question or part question on the Question Paper.
- You are advised that an answer may receive **no marks** unless you show sufficient detail of the working to indicate that a correct method is being used.
- The total number of marks for this paper is **100**.
- The Printed Answer Book consists of **16** pages. The Question Paper consists of **8** pages. Any blank pages are indicated.

Section A

1 (i)	
1 (ii)	
2 (i)	
2 (ii)	

3 (i)

3 (ii)

4	

5 (i)

5 (ii)

6 (i)	
6 (ii)	

7 (i)

7 (ii)

8 (i)	
8 (ii)	
8 (iii)	

9 (i)	
9 (ii)	
9 (iii)	

Section B

10 (i)	
10 (ii)	
10 (iii)	

10 (iv)	
10 (v)	

11 (i)	
11 (ii)	

11 (iii)

12 (i)	
12 (ii)	
12 (iii)	

13 (i)	
13 (ii)	
13 (iii)	

13 (iv)	
13 (v)	Take P to be the point (2, 16) Take Q to be the point (2 + h, (2 + h)⁴) The gradient of the chord PQ is given by $\frac{(2+h)^4 - 16}{h} =$

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