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For Examiner's Use
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General Certificate of Secondary Education  
June 2008



**MATHEMATICS (MODULAR) (SPECIFICATION B)  
Module 3 Higher Tier Section A**

**43003/HA**  
**H**

Tuesday 24 June 2008 9.00 am to 9.40 am

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• mathematical instruments</li> <li>• a treasury tag.</li> </ul>	
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For Examiner's Use			
Section A		Section B	
Pages	Mark	Pages	Mark
2–3		2–3	
4–5		4–5	
6		6	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

Time allowed for Section A: 40 minutes

**Instructions**

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Use a calculator where appropriate.
- Do all rough work in this book.
- This paper is divided into two sections: Section A and Section B.
- After the 40 minutes allowed for Section A, you must put your calculator on the floor under your seat. You will then be given Section B.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

**Information**

- The maximum mark for Section A is 32.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

**Advice**

- In all calculations, show clearly how you work out your answer.



J U N 0 8 4 3 0 0 3 H A 0 1

Answer **all** questions in the spaces provided.

1 Calculate  $\frac{5.6 \times 7.8}{4.3 - 2.1}$

.....  
.....

1 (a) Write down your full calculator display.

Answer ..... (1 mark)

1 (b) Write your answer to part (a) to one decimal place.

Answer ..... (1 mark)

2 The cost of hiring a car is described in an advert.

<b>HIRE CAR RATES</b>	
Day 1	£45
Each extra day $\frac{1}{3}$ off Day 1 price	

Herbie hires a car.  
The total cost is £165.

For how many days does Herbie hire the car?

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.....  
.....

Answer ..... (3 marks)



3 There are 126 people at a party.  
The ratio of adults to children at the party is 1 : 6

3 (a) How many adults and children are there?

.....  
.....  
.....

Answer Adults .....  
Children ..... (3 marks)

3 (b) Nine more adults arrive.

Including these adults, what is the new ratio of adults to children?  
Give your answer in the form 1 :  $k$ , where  $k$  is to be found.

.....  
.....  
.....

Answer ..... (3 marks)

4 Work out the percentage increase from 60 to 84.

.....  
.....  
.....

Answer ..... % (3 marks)



- 5 The table shows the estimated number of pet cats in some countries.

Country	Estimated number of pet cats
Brazil	$1.2 \times 10^7$
China	$5.3 \times 10^7$
France	9 600 000
Japan	$7.3 \times 10^6$
UK	$7.7 \times 10^6$
USA	$7.6 \times 10^7$
<b>Total</b>	$1.656 \times 10^8$

- 5 (a) Write, in standard form, the estimated number of pet cats in France.

Answer ..... (1 mark)

- 5 (b) Which of these countries has just over 32% of the total estimated number of pet cats?  
You **must** show your working.

.....

.....

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.....

Answer ..... (3 marks)



- 6 Helen weighed 100 kg.  
Her target was to weigh 70 kg or less.  
Her weight decreased by 4% each month.

Has she achieved her target after nine months?  
You **must** show your working.

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.....

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(3 marks)

- 7 (a) Work out the value of  $2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2$

.....

.....

Answer ..... (1 mark)

- 7 (b) The sum of the squares of the first seven prime numbers is equal to the expression  $3a + 3a^3$  where  $a$  is an integer.

Show that  $a = 6$

.....

.....

.....

.....

.....

(3 marks)



8 You are given that  $x \propto \frac{1}{\sqrt{y}}$

When  $y = 1.44$ ,  $x = 3.6$

Find an equation connecting  $x$  and  $y$ .

.....  
.....  
.....  
.....

Answer ..... (3 marks)

9 In the expression  $\frac{PQ}{R}$

$P = 50$  to one significant figure.

$Q = 1000$  to two significant figures.

$R = 0.04477$  to four significant figures.

Find the minimum value of  $\frac{PQ}{R}$

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Answer ..... (4 marks)

**END OF SECTION A**



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General Certificate of Secondary Education  
June 2008



**MATHEMATICS (MODULAR) (SPECIFICATION B)**  
**Module 3 Higher Tier Section B**

**43003/HB**

**H**

Tuesday 24 June 2008 9.45 am to 10.25 am

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>mathematical instruments.</li> </ul> <p>You must <b>not</b> use a calculator.</p>	
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Time allowed for Section B: 40 minutes

**Instructions**

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book.
- You may **not** use your calculator in Section B. Your calculator must remain on the floor under your seat.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

**Information**

- The maximum mark for Section B is 32.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

**Advice**

- In all calculations, show clearly how you work out your answer.



J U N 0 8 4 3 0 0 3 H B 0 1

Answer **all** questions in the spaces provided.

**10** You are given that  $\frac{34\,888}{98} = 356$

**10** (a) Write down the value of

**10** (a) (i)  $356 \times 980$

Answer ..... (1 mark)

**10** (a) (ii)  $\frac{34\,888}{9.8}$

Answer ..... (1 mark)

**10** (b) Hence work out  $\frac{34\,888}{4.9}$

.....  
.....

Answer ..... (2 marks)

**11** Work out the time taken to travel 5 miles at 30 miles an hour.  
Give your answer in minutes.

.....  
.....  
.....

Answer ..... minutes (3 marks)



12 (a) Work out  $\frac{3}{5} - \frac{2}{7}$

.....  
.....  
.....

Answer ..... (2 marks)

12 (b) Use your answer to part (a) to write down the answer to

$$1\frac{3}{5} - \frac{2}{7}$$

.....

Answer ..... (1 mark)

13 Tom says that there are no numbers less than 100 which are both a square number and a cube number.

Find **two** examples to show that Tom is wrong.

.....  
.....  
.....

Answer ..... and ..... (2 marks)



- 14** (a) Work out  $8 \times 24$  as the product of prime factors.  
Give your answer in index form.

.....  
 .....  
 .....

Answer ..... (3 marks)

- 14** (b) Find the Highest Common Factor (HCF) of  $x$  and  $3x$ .

.....

Answer ..... (1 mark)

- 15** (a) Write  $7.2 \times 10^{-5}$  as an ordinary number.

.....

Answer ..... (1 mark)

- 15** (b) Work out  $7.2 \times 10^{-5} \div 0.000\,003\,6$

.....  
 .....  
 .....

Answer ..... (2 marks)

- 16** Work out the reciprocal of 40.  
Give your answer as a decimal.

.....  
 .....  
 .....

Answer ..... (2 marks)



17 This year a club has 375 members.  
This is 25% more than last year.

How many members did the club have last year?

.....  
.....  
.....  
.....

Answer ..... (3 marks)

18 You are given that  $\sqrt{20} + \sqrt{45} + \sqrt{80} = p\sqrt{q}$   
where  $p$  and  $q$  are integers.

Find the values of  $p$  and  $q$ .  
You **must** show your working.

.....  
.....  
.....  
.....

Answer  $p =$  .....

$q =$  ..... (3 marks)



19 Charlie claims that the values of the three numbers below are equal.

$$81^{-\frac{3}{4}} \quad (3^3)^{-1} \quad 0.\dot{0}3\dot{7}$$

Is Charlie correct?  
You **must** show your working.

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(5 marks)

**END OF QUESTIONS**



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