Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

MATHEMATICS (MODULAR) (SPECIFICATION B)   **43053/HA**
Module 3   Higher Tier Section A
Non-coursework Specification

H

Tuesday 24 June 2008   9.00 am to 9.45 am

For this paper you must have:
- a calculator
- mathematical instruments
- a treasury tag.

Time allowed for Section A: 45 minutes

For Examiner's Use

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			

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 45 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 35.
- 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.

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

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

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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.

HIRE CAR RATES

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?

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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.

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Answer .... *(3 marks)*

4 Work out the percentage increase from 60 to 84.

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Answer .... % *(3 marks)*

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

Country	Estimated number of pet cats
Brazil	1.2×10^7
China	5.3×10^7
France	9.6×10^6
Japan	7.3×10^6
UK	7.7×10^6
USA	7.6×10^7
Total	1.656×10^8

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 Simplify $\dfrac{3(x-2)^2}{x-2}$

Give your answer in the form $ax+b$ where a and b are integers.

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Answer .... *(2 marks)*

7 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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(3 marks)

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

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Answer .... *(1 mark)*

8 (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.

8 (b) (i) Factorise fully $3a + 3a^3$

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Answer .... *(2 marks)*

8 (b) (ii) Hence or otherwise show that $a = 6$

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(3 marks)

14

Turn over ▶

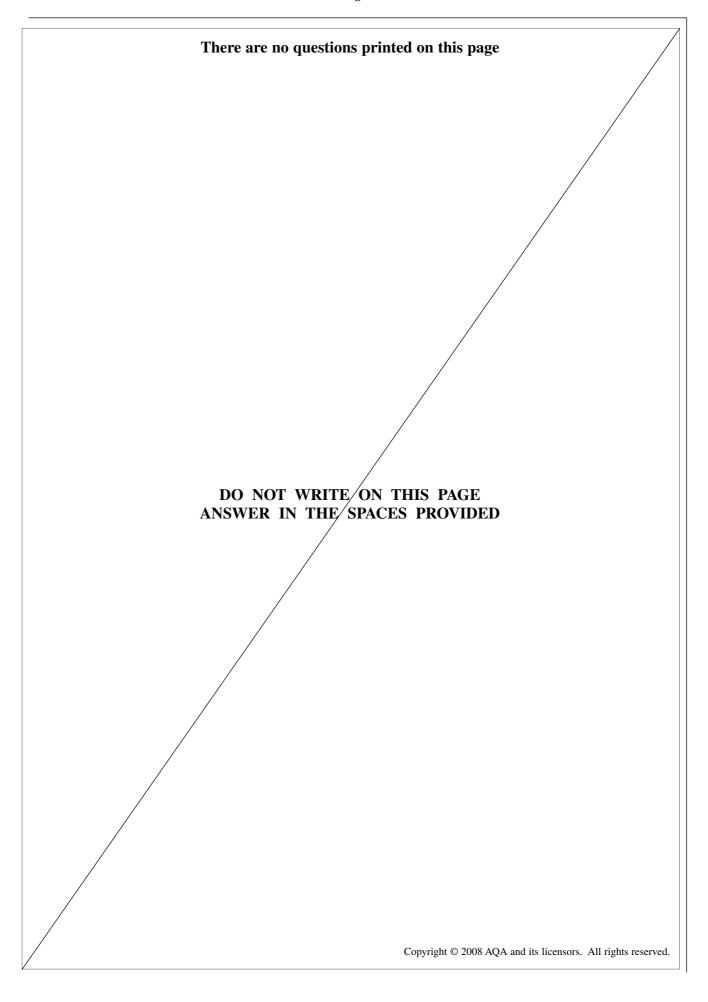**9** You are given that $x \propto \dfrac{1}{\sqrt{y}}$

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

Find an equation connecting x and y.

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Answer .... *(3 marks)*

10 In the expression $\dfrac{PQ}{R}$

$P = 50$ to one significant figure

$Q = 1000$ to two significant figures

$R = 0.044\,77$ to four significant figures.

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

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Answer .... *(4 marks)*

END OF SECTION A

7

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General Certificate of Secondary Education
June 2008

MATHEMATICS (MODULAR) (SPECIFICATION B)   **43053/HB**
Module 3   Higher Tier   Section B
Non-coursework Specification

H

Tuesday 24 June 2008   9.50 am to 10.35 am

For this paper you must have:
 • mathematical instruments.

You must **not** use a calculator.

Time allowed for Section B: 45 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 35.
 • 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.

43053/HB

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

11 You are given that $\dfrac{34\,888}{98} = 356$

11 (a) Write down the value of

11 (a) (i) 356×980

Answer .... *(1 mark)*

11 (a) (ii) $\dfrac{34\,888}{9.8}$

Answer .... *(1 mark)*

11 (b) Hence work out $\dfrac{34\,888}{4.9}$

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Answer .... *(2 marks)*

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

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Answer .... minutes *(3 marks)*

13 (a) Work out $\dfrac{3}{5} - \dfrac{2}{7}$

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Answer .... *(2 marks)*

13 (b) Use your answer to part (a) to write down the answer to $1\dfrac{3}{5} - \dfrac{2}{7}$

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Answer .... *(1 mark)*

14 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.

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

Turn over for the next question

12

Turn over ▶

15 (a) Work out 8×24 as the product of prime factors.
Give your answer in index form.

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Answer .... *(3 marks)*

15 (b) Find the Highest Common Factor (HCF) of x and $3x$.

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Answer .... *(1 mark)*

16 (a) Write 7.2×10^{-5} as an ordinary number.

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Answer .... *(1 mark)*

16 (b) Work out $7.2 \times 10^{-5} \div 0.0000036$

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Answer .... *(2 marks)*

17 Work out the reciprocal of 40.
Give your answer as a decimal.

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Answer .... *(2 marks)*

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

How many members did the club have last year?

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Answer .... *(3 marks)*

19 (a) You are given that $(\sqrt{4x} + \sqrt{9x})^2 = kx$

where k is an integer.

Find the value of k.
You **must** show your working.

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Answer $k =$ .... *(4 marks)*

19 (b) Hence or otherwise evaluate $(\sqrt{20} + \sqrt{45})^2$

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Answer .... *(2 marks)*

18

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

$$81^{-\frac{3}{4}} \qquad (3^3)^{-1} \qquad 0.0\dot{3}\dot{7}$$

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

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(5 marks)

END OF QUESTIONS

5

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