

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
November 2006



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

43003/HA

H
TWO TIER

Monday 13 November 2006 9.00 am to 9.40 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments • a treasury tag. 	
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For Examiner's Use			
Section A		Section B	
Pages	Mark	Pages	Mark
2–3		3	
4–5		4–5	
		6–7	
		8	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

Time allowed for Section A: 40 minutes

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- 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.

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

- 1 A school raises £660 from a sponsored walk.

The £660 was raised by teachers and pupils in the ratio 1 : 9
The pupils raised the larger amount of money.

How much money did the pupils raise?

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Answer £ (2 marks)

- 2 You are given that

1 litre = 1.76 pints and 1 gallon = 8 pints

Convert 25 litres to gallons.
Show your working.

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Answer gallons (3 marks)

- 3 Erin is squaring numbers.

She says that it is possible to get an answer that is smaller than the number she started with.

Show that Erin is correct.

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(2 marks)

4 (a) Alice sees two advertisements for the same MP3 player.

CutPrices
£80
Price does not include VAT

The Audio Store
£92
Price includes VAT

The rate of VAT is $17\frac{1}{2}\%$.

Alice works out that the MP3 player costs more at CutPrices than at The Audio Store.

How much more does it cost at CutPrices?

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Answer £ (3 marks)

(b) In a sale the price of a digital radio decreases from £75 to £66.

Work out the percentage decrease in price.

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Answer % (3 marks)

(c) In a sale the price of a CD player decreases by 60%.
The sale price is £18.60

Work out the price before the sale.

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Answer £ (3 marks)

5 Use your calculator to work out

(a) the reciprocal of 0.8

Answer (1 mark)

(b) $\sqrt{6.4^2 + 3.18^3}$

(i) Write down the full calculator display.

Answer (1 mark)

(ii) Write your answer to 2 significant figures.

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Answer (1 mark)

6 When two numbers are multiplied together the answer is 6.4×10^{15}

One of the numbers is 8×10^9

Work out the other number.

Give your answer in standard form.

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Answer (3 marks)

7 y is inversely proportional to the square of x .
When $y = 50$, $x = 2$

(a) Find an equation connecting y and x .

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.....

Answer (3 marks)

(b) Work out the value of x when $y = 32$

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.....

Answer $x =$ (3 marks)

8 On a day in November 45% of the pupils at a school have flu.
Of the pupils who have flu, 80% are absent from school.
6% of the pupils who do not have flu are absent from school for other reasons.

Work out the percentage of the pupils at the school who are absent on this day.
You **must** show your working.

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Answer % (4 marks)

END OF SECTION A

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There are no questions printed on this page

There are no questions printed on this page

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General Certificate of Secondary Education
November 2006



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

43003/HB

**H
TWO TIER**

Monday 13 November 2006 9.45 am to 10.25 am

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

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- 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.

There are no questions printed on this page

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

9 The ingredients needed to make 500 millilitres (ml) of a fruit drink are

orange juice	300 ml
mango juice	60 ml
lemonade	140 ml

(a) What percentage of the fruit drink is orange juice?

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Answer % (2 marks)

(b) Dan makes some of the fruit drink.
He uses 30 ml of mango juice.

How much of the fruit drink does he make?

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Answer ml (1 mark)

(c) Robert wants to make 750 ml of the fruit drink.

How much lemonade will he need?

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.....

Answer ml (2 marks)

- 10 Karl sees this advertisement in a shop window.

HOCKEY KIT

Shirt £16.50

Pair of Shorts £8.50

SPECIAL OFFER!

Buy both items and receive a 10% reduction in price

Karl buys both items.

How much does he pay?

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Answer £ (3 marks)

- 11 Find an approximate value of $\frac{7.93 \times 503}{0.486}$

You **must** show your working.

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Answer (3 marks)

12 When written as the product of prime factors $225 = 3^2 \times 5^2$

- (a) Write 150 as the product of prime factors.
Give your answer in index form.

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Answer (3 marks)

- (b) Work out the highest common factor (HCF) of 225 and 150.

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Answer (2 marks)

13 Work out $3.45 \times 10^4 - 8.2 \times 10^3$

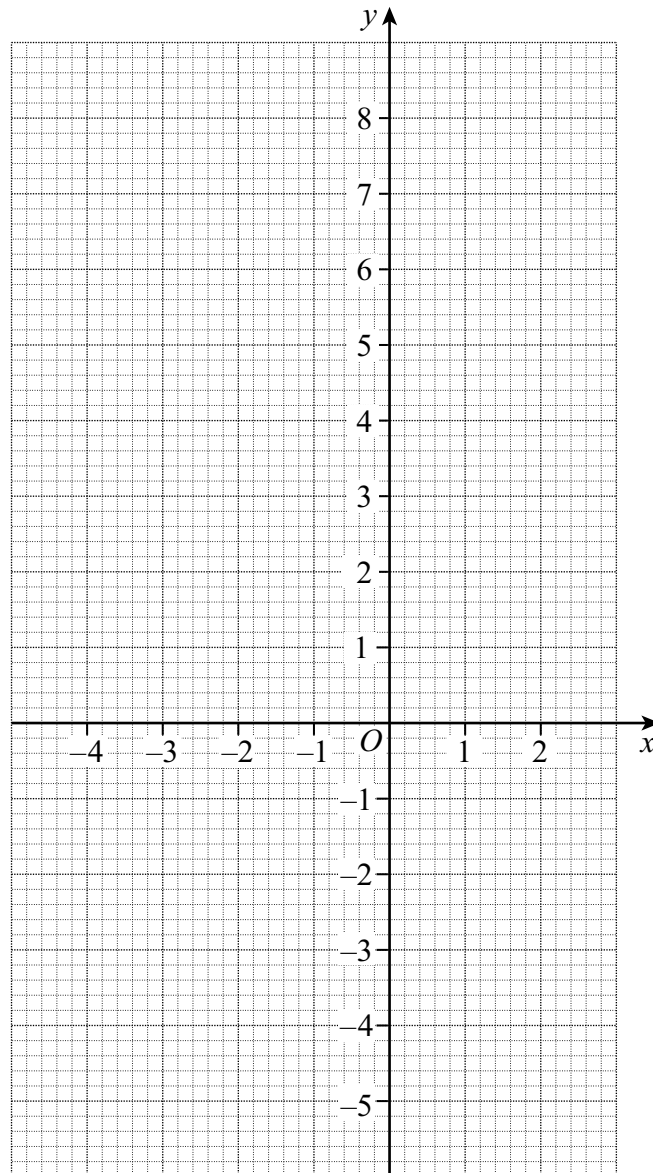
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Answer (2 marks)

14 Here is a table of values for the equation $y = x^2 + 3x - 2$

x	-4	-3	-2	-1.5	-1	0	1	2
y	2	-2	-4	-4.25	-4	-2	2	8

(a) On the grid, draw the graph of $y = x^2 + 3x - 2$ for values of x from -4 to $+2$



(2 marks)

- (b) Use your graph to find the solutions of the equation $x^2 + 3x - 2 = 0$

.....

Answer $x = \dots\dots\dots$ and $x = \dots\dots\dots$ (2 marks)

- (c) By drawing a linear graph on the same axes, find the solutions of the equation

$$x^2 - 3 = 0$$

.....

Answer $x = \dots\dots\dots$ and $x = \dots\dots\dots$ (3 marks)

- 15 (a) Simplify fully $\sqrt{75} + \sqrt{27}$
 You **must** show your working.

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Answer (2 marks)

- (b) Rationalise the denominator and simplify $\frac{21}{\sqrt{7}}$

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Answer (2 marks)

16 Simplify fully

(a) $(3^5)^4$

Give your answer as a power of 3.

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Answer (1 mark)

(b) $1000^{-\frac{2}{3}}$

Give your answer as a fraction.

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Answer (2 marks)

END OF QUESTIONS