

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2007



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

43003/HA

H
TWO TIER

Wednesday 27 June 2007 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
3		2–3	
4–5		4–5	
6–7		6	
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.

There are no questions printed on this page

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

1 Use your calculator to work out

$$\frac{7.6 \times 18}{3.8 + 2.4}$$

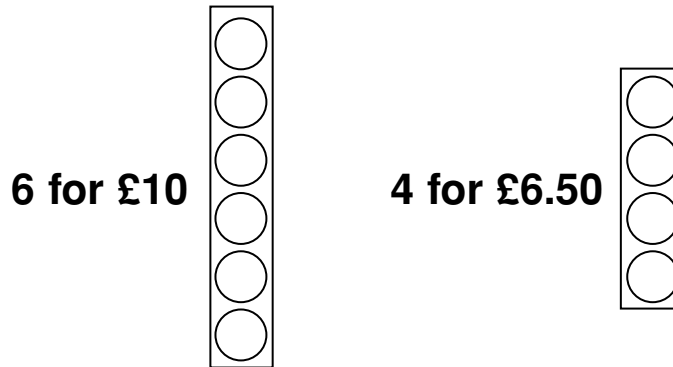
(a) Write down your full calculator display.

Answer (1 mark)

(b) Write your answer to one decimal place.

Answer (1 mark)

2 A shop sells tennis balls in two different sized packs.



Which pack is better value?
You **must** show your working.

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Answer (3 marks)

3 A single room in a hotel in France costs 385 euros for one week.

(a) The cost of a single room increases by 12% when breakfast is included.

How many euros will it cost for a single room for one week when breakfast is included?

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Answer euros (3 marks)

(b) Sunil drives 164 kilometres to the hotel.
His journey takes $2\frac{1}{2}$ hours.

Work out his average speed.
Give your answer in kilometres per hour.

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Answer kilometres per hour (2 marks)

4 On Friday the ratio of the time Priya is sleeping to the time she is awake is 3 : 5
She is sleeping for less time than she is awake.

(a) Work out the number of hours that she is sleeping on Friday.

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Answer hours (2 marks)

(b) On Saturday she sleeps for one hour more than she did on Friday.

Show that the ratio of the time she is sleeping to the time she is awake on Saturday is 5 : 7

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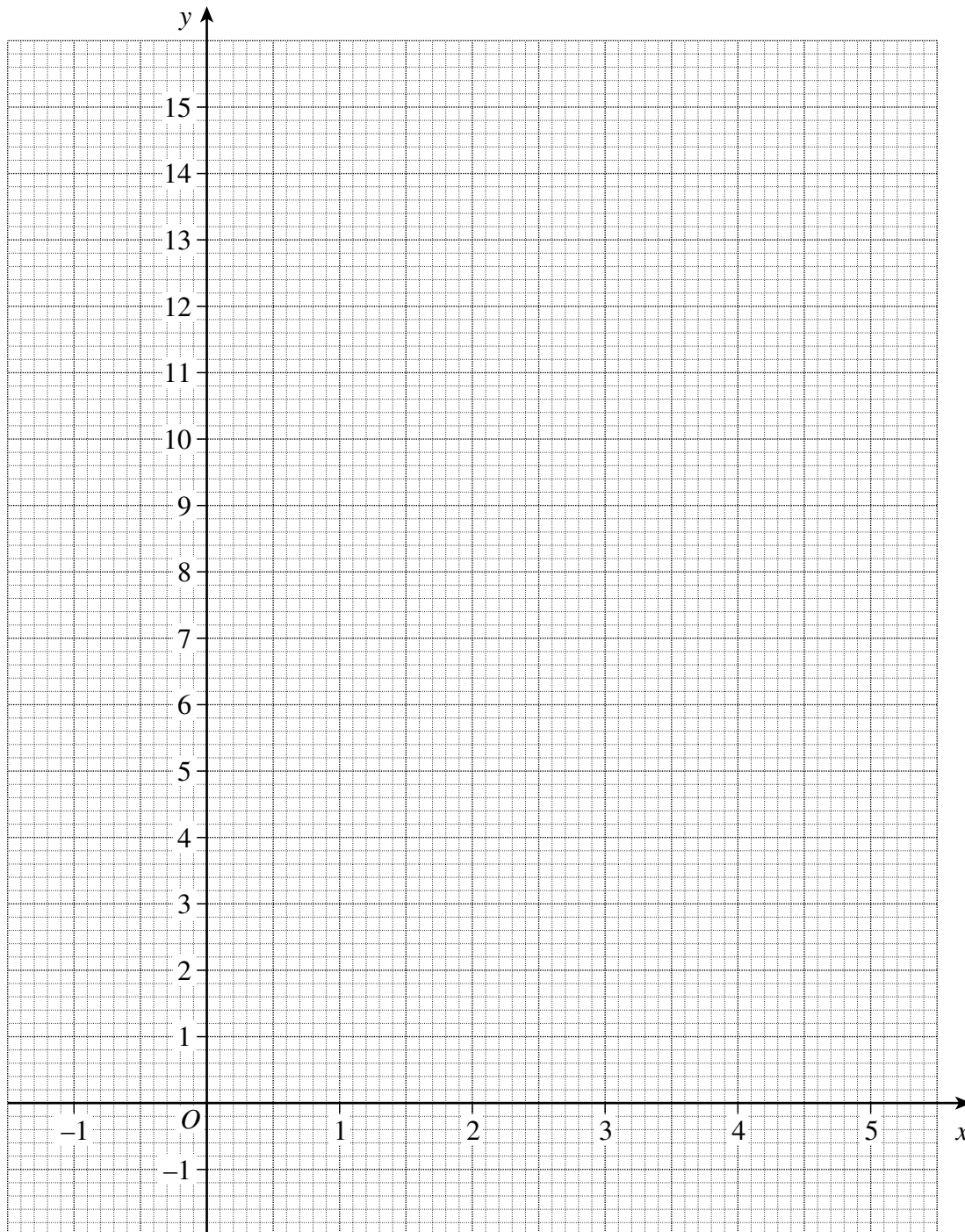
(3 marks)

Turn over for the next question

5 Here is a table of values for the graph $y = x^2 - 2x$

x	-1	0	1	2	3	4	4.5	5
y	3	0	-1	0	3	8	11.25	15

(a) On the grid draw the graph of $y = x^2 - 2x$ for values of x from -1 to $+5$.



(2 marks)

(b) (i) On the grid draw the line $y = 10$ for values of x from -1 to $+5$. (1 mark)

(ii) Use your graphs to find the positive solution to the equation $x^2 - 2x = 10$

Answer $x =$ (1 mark)

(c) The equation $x^2 - x - 1 = 0$ can be solved by drawing another line on the grid.

Work out the equation of this line.

Do **not** draw the line.

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Answer (2 marks)

6 (a) Write 98 million in standard form.

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Answer (1 mark)

(b) Multiply 2.4×10^{-3} by 3.6×10^{-5}

Give your answer in standard form.

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Answer (2 marks)

Turn over for the next question

7 A is directly proportional to B^2
When $A = 50$, $B = 10$

(a) Find an equation connecting A and B .

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Answer (3 marks)

(b) Find the value of B when $A = 72$

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Answer (2 marks)

8 Convert $0.4\dot{7}\dot{1}$ to a fraction.
Give your answer in its simplest form.

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Answer (3 marks)

END OF SECTION A

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General Certificate of Secondary Education
June 2007



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

43003/HB

H

TWO TIER

Wednesday 27 June 2007 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.

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

9 Work out $\frac{3}{8} \div \frac{1}{3}$

.....

Answer (2 marks)

10 Football teams are given points after each match they play as shown.

Win	3 points
Draw	1 point
Lose	0 points

(a) Milly's team has played 10 matches and has been given 17 points.

Work out the **two** ways that her team could have been given 17 points.

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First way

Number of matches won	
Number of matches drawn	
Number of matches lost	

Second way

Number of matches won	
Number of matches drawn	
Number of matches lost	

(2 marks)

(b) Milly says that after two more matches the total points will still be an odd number.

Explain why she may **not** be correct.

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(1 mark)

11 For every £50 spent on petrol, £37 of this is tax.

(a) Work out £37 as a percentage of £50.

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Answer % (2 marks)

(b) Colin spends £10 on petrol.

How much of this is tax?

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Answer £ (2 marks)

12 (a) Express 100 as the product of prime factors.
Write your answer in index form.

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Answer (3 marks)

(b) You are given that $56 = 2^3 \times 7$

Find the least common multiple (LCM) of 56 and 100.

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Answer (2 marks)

13 Simon uses this method to work out $87\frac{1}{2}\%$ of 240.

$$\begin{array}{r}
 50\% \text{ of } 240 = 120 \\
 25\% \text{ of } 240 = 60 \\
 \underline{12\frac{1}{2}\% \text{ of } 240 = 30} \\
 \text{Adding} \quad \underline{87\frac{1}{2}\% \text{ of } 240 = 210}
 \end{array}$$

- (a) Use Simon's method to work out $87\frac{1}{2}\%$ of 96.
You **must** show your working.

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Answer (2 marks)

- (b) Pete says that he can work out $93\frac{3}{4}\%$ of 240 by using Simon's method with one extra step.

Explain how Pete can do this.

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(2 marks)

- 14 (a) Write down the value of 9^0

Answer (1 mark)

- (b) Work out 10^{-3}
Give your answer as a decimal.

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Answer (2 marks)

- (c) Work out $\frac{5^9 \times 5^2}{5^3}$

Give your answer as a power of 5.

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Answer (2 marks)

- 15 A book has a front and back cover and 100 pages.
The front and back cover are each 0.8 millimetres thick when measured to one decimal place.
Each page is 0.15 millimetres thick when measured to two decimal places.

Calculate the minimum thickness of the book.
You **must** show your working.

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Answer mm (5 marks)

16 (a) Simplify fully $\sqrt{2}(\sqrt{8} - \sqrt{2})$

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Answer (2 marks)

(b) Given that $x = \sqrt{2}$ $y = \sqrt{5}$ $z = \sqrt{10}$

work out the value of $\frac{y}{xz}$

Write your answer in its simplest form.

.....

Answer (2 marks)

END OF QUESTIONS

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