Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

For Examiner's Use

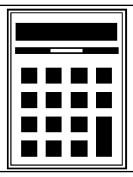
General Certificate of Secondary Education
March 2008

MATHEMATICS (MODULAR) (SPECIFICATION B) 43003/HA
Module 3 Higher Tier Section A

H

Monday 3 March 2008 9.00 am to 9.40 am

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



For Examiner's Use			
Section A		**Section B**	
Pages	Mark	Pages	Mark
2–3		3	
4–5		4–5	
6		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 Sunita runs for 32 seconds at an average speed of 6 metres per second.

Work out the distance that Sunita runs.

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Answer ..... metres *(2 marks)*

2 The chocolates in a large tin are shared equally between 20 children.
They receive 9 chocolates each.

If there were only 15 children, how many chocolates would each child receive?

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

3 Adam scored 24 marks out of 40 in a test.
Ben scored 65% in the same test.

Who obtained the better result?
You **must** show your working.

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

4 Work out as a decimal $\dfrac{4.6^2}{8.6 - 2.7}$

(a) Write down your full calculator display.

Answer ..... *(1 mark)*

(b) Write your answer to three significant figures.

Answer ..... *(1 mark)*

5 Work out

(a) the reciprocal of 1.25

Answer ..... *(1 mark)*

(b) $16^{2.5}$

Answer ..... *(1 mark)*

(c) $\sqrt{(-5)^2 - 4 \times 1 \times (-24)}$

Answer ..... *(1 mark)*

(d) $(8.32 \times 10^{13}) \div (6.4 \times 10^{15})$

Write your answer in standard form.

.....

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

Turn over for the next question

14

6 In 2006 the population of a town was 68 000.
By 2007 the population had decreased by 3%.

(a) What number does 68 000 need to be multiplied by to obtain the population in 2007?

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Answer ..... *(1 mark)*

(b) It is predicted that the population will decrease by 3% each year until 2009.

Work out the predicted population in 2009.
Give your answer to the nearest hundred.

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Answer ..... *(4 marks)*

7 Simplify $\dfrac{(5^8)^3}{25 \times 5^4}$

Give your answer as a power of 5.

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Answer ..... *(4 marks)*

8 y is directly proportional to the square of x.

(a) When $x = 10$, $y = 200$

Work out an equation connecting y and x.

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

(b) Work out the value of y when $x = 3$

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Answer ..... *(1 mark)*

(c) Sketch a graph of y against x on the axes below.

(1 mark)

Turn over for the next question

9 The attendance at a rugby match is 72 000.
This number is correct to the nearest 1000.
The number of females attending the match is 16 000.
This number is correct to the nearest 500.

Work out the maximum number of males that could be attending the match.
You **must** show your working.

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Answer ..... *(4 marks)*

END OF SECTION A

4

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There are no questions printed on this page

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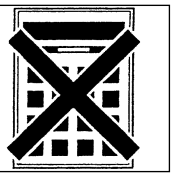
General Certificate of Secondary Education
March 2008

ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 43003/HB
Module 3 Higher Tier Section B

H

Monday 3 March 2008 9.45am to 10.25 am

For this paper you must have: • mathematical instruments. You must **not** use a calculator.	

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.

10 Estimate the value of $4.9 + 7.3 \times 19.8 - 9.6$

You **must** show your working.

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

11 Given that $3.75 \times 38 = 142.5$

(a) work out 37.5×0.38

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Answer ..... *(1 mark)*

(b) work out $142.5 \div 3.8$

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Answer ..... *(1 mark)*

(c) work out 3.75×39

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

7

12 (a) Work out $\frac{3}{5} \div 4$

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

(b) Work out $56^1 - 56^0$

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

(c) (i) Explain why $27^{\frac{1}{3}} = 3$

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(1 mark)

(ii) Write $27^{-\frac{1}{3}}$ as a fraction.

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Answer ..... *(1 mark)*

13 Year 10 and Year 11 pupils are in an assembly.
Here are some facts about the pupils in the assembly.

Year	boys : girls	Pupil data
10	4 : 5	84 boys
11	2 : 3	150 pupils

Work out the total number of girls in the assembly.
You **must** show your working.

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Answer ..... *(5 marks)*

14 Write in standard form

(a) 379 million

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Answer ..... *(1 mark)*

(b) 14×10^{-8}

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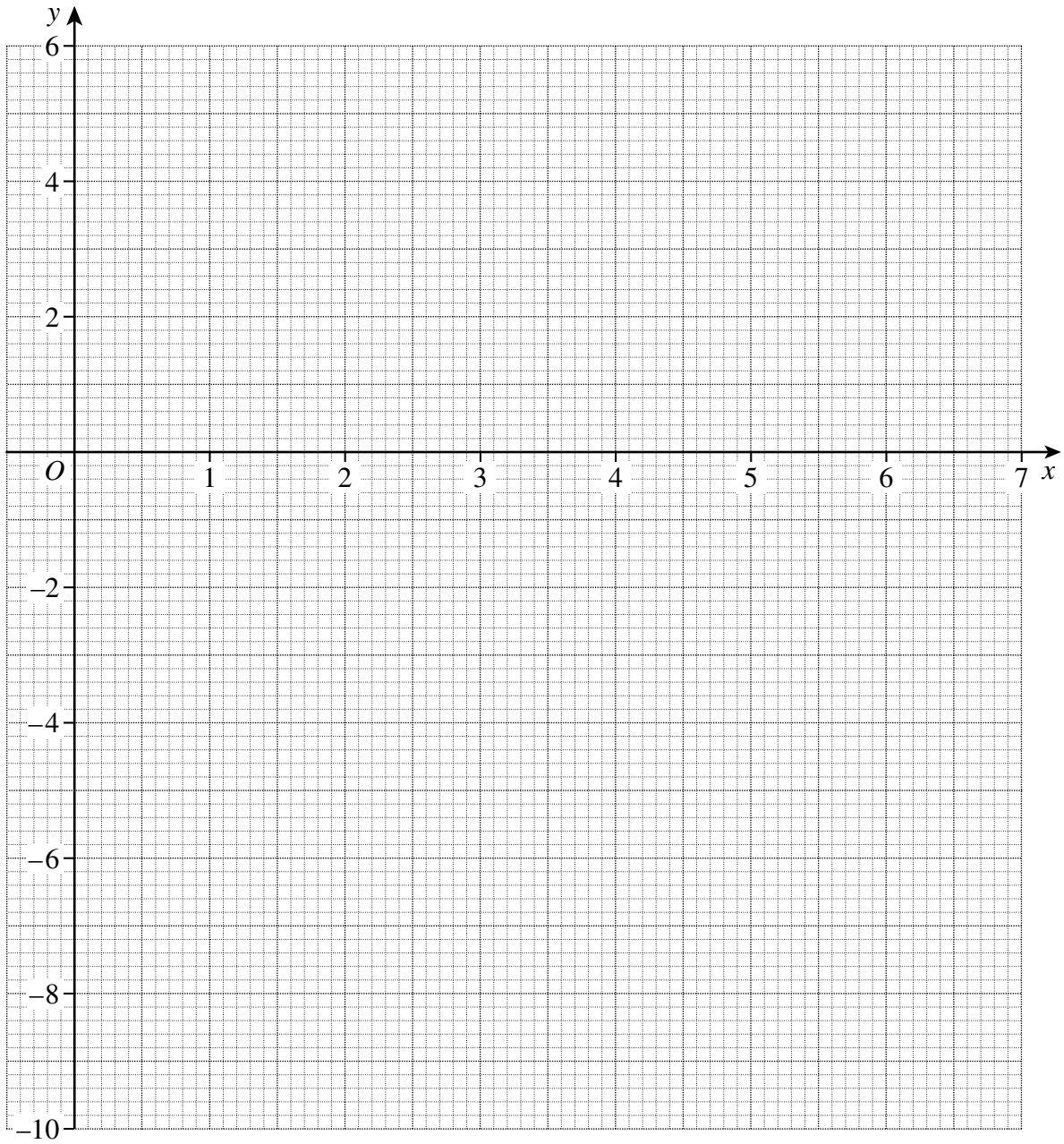
Answer ..... *(1 mark)*

13

15 Here is a table of values for the equation $y = x^2 - 6x - 1$

x	0	1	2	3	4	5	6	7
y	–1	–6	–9	–10	–9	–6	–1	6

(a) Draw the graph of $y = x^2 - 6x - 1$ for values of x from 0 to 7.



(2 marks)

(b) Use your graph to write down the positive solution of $x^2 - 6x - 1 = 0$

Answer ..... *(1 mark)*

(c) (i) Draw the graph of $y = 2 - x$ on the grid.

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(1 mark)

(ii) The x-coordinate of the point of intersection of the graphs $y = x^2 - 6x - 1$ and $y = 2 - x$ is a solution of a quadratic equation.

What is this quadratic equation?
Give your answer in the form $ax^2 + bx + c = 0$

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

Turn over for the next question

7

16 The formula to find the volume of a cylinder is

$$\text{Volume} = \pi \times \text{radius}^2 \times \text{height}$$

A cylinder has radius = $2\sqrt{3}$ metres and height = $\frac{1}{\sqrt{2}}$ metres.

Work out the volume of the cylinder in terms of π.
Rationalise the denominator and give your answer in its simplest form.

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Answer ..... m^3 *(5 marks)*

END OF QUESTIONS

5