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For Examiner's Use

General Certificate of Secondary Education
June 2009



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

43053/HA

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Tuesday 23 June 2009 9.00 am to 9.45 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		2–3	
4–5		4–5	
6		6–7	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

Time allowed for Section A: 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.
- 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.



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

1 Work out $\frac{21.6 \times 64}{35.1 + 9.57}$

1 (a) Write down your full calculator display.

Answer (1 mark)

1 (b) Write your answer to two decimal places.

Answer (1 mark)

2 Increase 125 by 36%.

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

Answer (3 marks)



3 The normal price of a 500 gram packet of rice is 90p.
There are two special offers.

Offer A
50% off the normal price

Offer B
50% extra rice free
Price still only 90p

Which offer is better value for money?
You **must** show your working.

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Answer (5 marks)

4 Write 40 as the product of prime factors.

Give your answer in index form.

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Answer (3 marks)



5 (a) (i) Expand and simplify $12x - 4(x - 1)$

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.....

Answer (2 marks)

5 (a) (ii) Expand and simplify $(d - 2)(d + 6)$

.....
.....

Answer (2 marks)

5 (b) (i) Factorise fully $2m^2 - 4m$

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.....

Answer (2 marks)

5 (b) (ii) Factorise $x^2 - 9y^2$

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.....

Answer (2 marks)



6 A puppy weighs 16.5 kilograms.
This is 150% of its weight when it was born.

How much did the puppy weigh when it was born?

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

Answer kg (3 marks)

7 £132 is shared between Ann, Bill and Cilla.
The ratio of Bill's share to Cilla's share is 2 : 5
Cilla's share is £60.

Work out Ann's share.

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.....
.....

Answer £ (3 marks)

Turn over for the next question



8 y is directly proportional to \sqrt{x}

x	100	
y	12	36

Work out the missing value in the table.

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Answer (5 marks)

9 In the calculation $\frac{380}{72 - 44}$

all the numbers have been rounded to two significant figures.

Work out the minimum possible value of the calculation.

.....

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Answer (3 marks)

END OF SECTION A



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General Certificate of Secondary Education
June 2009



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

43053/HB

H

Tuesday 23 June 2009 9.50 am to 10.35 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: 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.



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

- 10** (a) Peter says that 2 hours 15 minutes written as a decimal is 2.15 hours.

Tanya says that 2 hours 15 minutes written as a decimal is 2.25 hours.

Explain why Tanya is correct.

.....

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(1 mark)

- 10** (b) Tanya cycles at an average speed of 10 miles per hour for 2 hours 15 minutes.

Work out the number of miles that she travels.

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.....

.....

Answer miles (2 marks)

11 Given that $2\frac{1}{2} \times 1\frac{3}{10} = 3\frac{1}{4}$

11 (a) write down the value of $7\frac{1}{2} \times 1\frac{3}{10}$

Answer (1 mark)

11 (b) write down the value of $2\frac{1}{2} \times 1\frac{3}{10} \div 3\frac{1}{4}$

Answer (1 mark)



12 There are 40 people at a party.

24 are boys and 16 are girls.

12 (a) Work out the percentage of boys at the party.

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.....
.....

Answer % (2 marks)

12 (b) Five more boys and five more girls arrive at the party.

Which statement is correct?

- A The percentage of boys at the party decreases.
- B The percentage of boys at the party increases.
- C The percentage of boys at the party stays the same.

You **must** show your working.

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Answer Statement (3 marks)



- 13 (a) Explain why $\sqrt{90}$ has a value between 9 and 10.

.....

(2 marks)

- 13 (b) Estimate the value of $\frac{297 \times 3.98}{0.102}$

.....

Answer (3 marks)

- 14 Ahmed uses $\frac{2}{3}$ of a litre of milk each day.
 He buys milk in 2 litre bottles.

What is the least number of bottles that he needs to buy for one week?
 You **must** show your working.

.....

Answer (3 marks)



15 (a) Work out $\frac{7 \times 10^{35}}{7 \times 10^{33}}$

.....

Answer (1 mark)

15 (b) Work out $4 \times 10^6 - 4 \times 10^5$

Give your answer in standard form.

.....

Answer (3 marks)

16 (a) Explain why $25^4 = 5^8$

.....
 (1 mark)

16 (b) Write 4^{-1} as a fraction

Answer (1 mark)

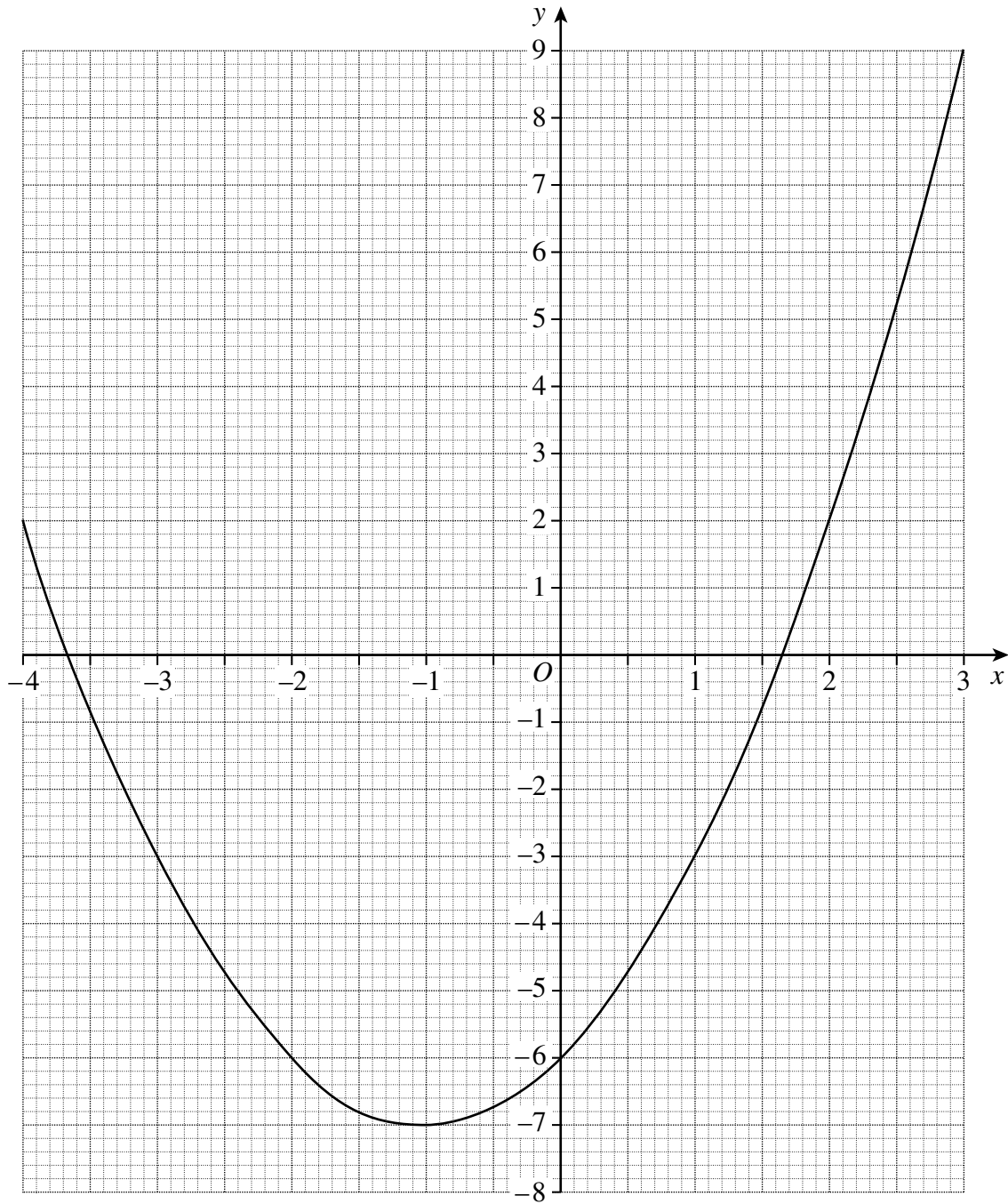
16 (c) Work out $8^{\frac{4}{3}}$

.....

Answer (2 marks)



17 The graph of $y = x^2 + 2x - 6$ is shown for values of x from -4 to 3 .



By drawing a suitable linear graph on the grid, find the solutions of the equation

$$x^2 + 2x - 6 = x + 2$$

.....

.....

.....

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

18 (a) Simplify fully $\frac{(\sqrt{3})^3}{6}$

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Answer (2 marks)

18 (b) Write $\frac{10}{\sqrt{2}} + \sqrt{8}$ in the form $k\sqrt{2}$.

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Answer (4 marks)

END OF QUESTIONS



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