

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

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General Certificate of Secondary Education
March 2004



MATHEMATICS (MODULAR) (SPECIFICATION B) 33003/HA
Module 3 Higher Tier Section A

H

Thursday 4 March 2004 9.00 am to 9.40 am

<p>In addition to this paper you will require:</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 – 7		6 – 7	
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 in the spaces provided.
- Do all rough work in this booklet.
- 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.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice

- In all calculations, show clearly how you work out your answer.

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

- 1 Craig and Sophie share 60 chocolates.
They divide them in the ratio 2:3 with Sophie having the larger share.

How many chocolates does Sophie have?

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Answer (2 marks)

- 2 (a) Write 18 as a product of its prime factors.

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Answer (2 marks)

- (b) Use your calculator to work out 0.4^6
Give your answer in standard form.

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Answer (2 marks)

- 3 Prove that the sum of any two consecutive numbers is always an odd number.

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(2 marks)

- 4 The value of a computer was £800 on 1st January 2003.
Every three months, the value of the computer decreased by 6% of its value at the start of that three months.

What was the value of the computer on 1st January 2004?

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.....
.....

Answer £ (3 marks)

- 5 John has 70 books.
This total is 40% more than the number of books that he had one year ago.

How many books did he have one year ago?

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.....
.....

Answer (3 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over 

6 This is a true statement.



Write down the maximum age that Kylie could be.

.....

Answer (1 mark)

- 7 The area of the screen of a television set is A square inches.
The length of the diagonal of the screen is d inches.
 A is directly proportional to the square of d .

A television set with an area of 90 square inches has a diagonal of length 15 inches.

- (a) Find an equation connecting A and d .

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Answer (3 marks)

- (b) Find the area of the screen of a television set with a diagonal of length 20 inches.

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Answer square inches (1 mark)

- (c) Another television set has a screen with an area of 250 square inches.
Find the length of its diagonal.

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.....

Answer inches (3 marks)

Turn over ►

8 (a) Express $0.\dot{4}\dot{2}$ as a fraction in its simplest form.

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Answer (2 marks)

(b) Hence, or otherwise, express $0.7\dot{4}\dot{2}$ as a fraction.

Write this fraction in its simplest form.

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Answer (3 marks)

9 Simon bought audio items and gives their approximate costs.

Prices up to £15 are given to the nearest £1.
Prices over £15 are given to the nearest £5.

Simon bought

a CD player,
a CD costing £12
and headphones costing £20.

He says that he paid £150 in total.
This total is given to the nearest £10.

Find the maximum possible price which Simon could have paid for the CD player.
You **must** show your working.

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Answer £ (5 marks)

END OF SECTION A

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General Certificate of Secondary Education
March 2004



MATHEMATICS (MODULAR) (SPECIFICATION B) 33003/HB
Module 3 Higher Tier Section B

H

Thursday 4 March 2004 9.45 am to 10.25 am

<p>In addition to this paper you will require: mathematical instruments. 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 in the spaces provided.
- Do all rough work in this booklet.
- 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.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.

Advice

- In all calculations, show clearly how you work out your answer.

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

- 10** A train is travelling at 60 miles per hour.
The train increases its speed to 81 miles per hour.

Calculate the percentage increase in the speed of the train.

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Answer% (3 marks)

- 11** (a) Work out $4\frac{2}{3} + 1\frac{3}{5}$

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Answer (3 marks)

- (b) Estimate the value of $\frac{407 \times 2.91}{0.611}$

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.....

Answer (3 marks)

- (c) Write down the value of 7^0

Answer (1 mark)

12 (a) Work out $5 \times 10^4 \times 8 \times 10^6$

Give your answer in standard form.

.....
.....

Answer (2 marks)

(b) Work out $\frac{2 \times 10^4}{8 \times 10^6}$

Give your answer in standard form.

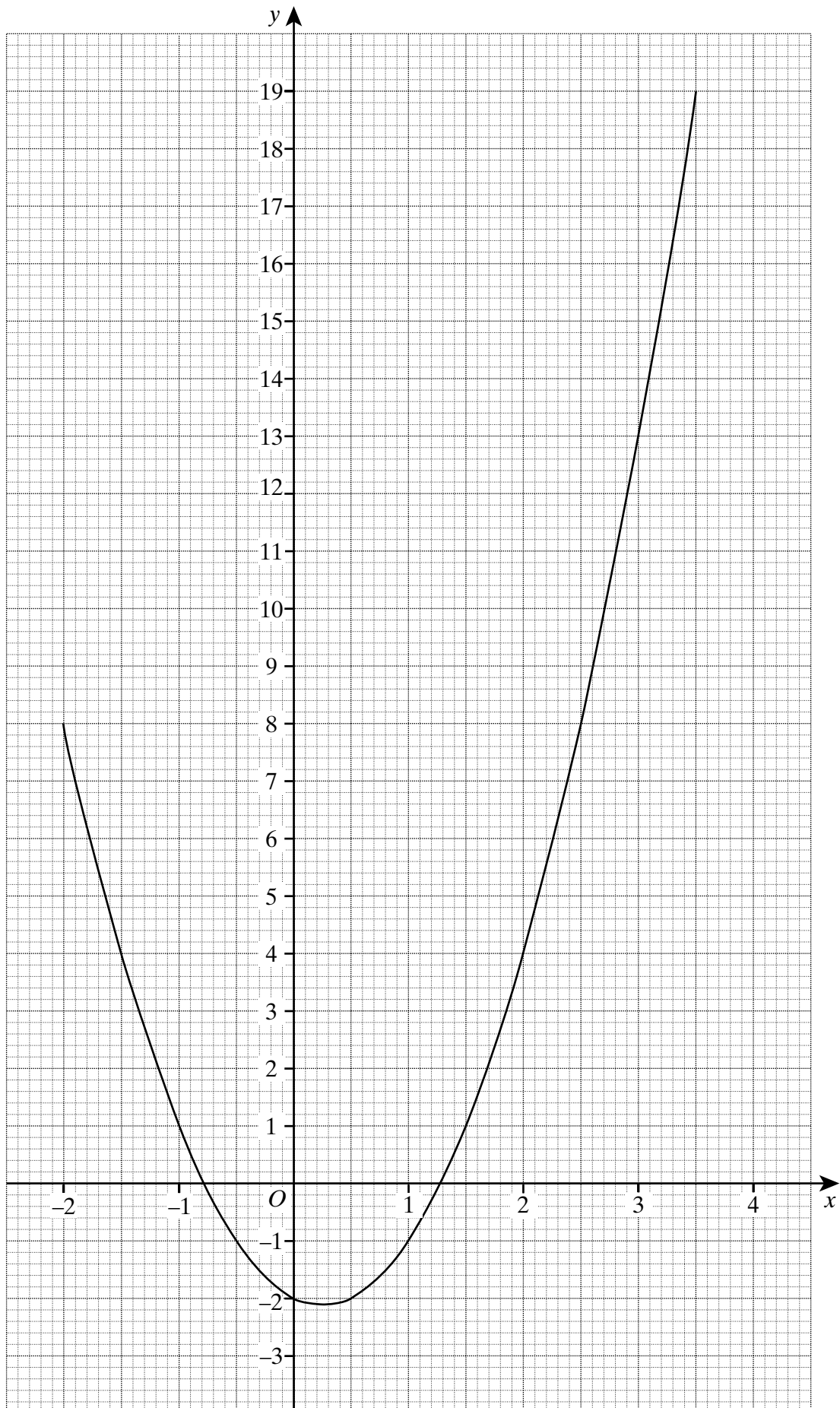
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Answer (3 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over 

13 The graph of $y = 2x^2 - x - 2$ is drawn below.



(a) Write down the solutions of $2x^2 - x - 2 = 0$.

.....

Answer (2 marks)

(b) By drawing an appropriate linear graph, write down the solutions of

$$2x^2 - 4x - 3 = 0$$

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Answer (3 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►



14 Carol sells strawberries.

In 2002 she reduced the weight of strawberries in each packet by 20%.

After receiving complaints, she increased the weight in 2003 back to the amount each packet contained in 2001.

What percentage increase did Carol use?

Give your answer as a percentage of the contents in a packet in 2002.

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Answer % (3 marks)

15 (a) Rationalise the denominator and simplify fully $\frac{1}{\sqrt{12}}$

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Answer (2 marks)

(b) By simplifying $\sqrt{32} - \sqrt{18}$,

write $\sqrt{3}(\sqrt{32} - \sqrt{18})$

in its simplest form.

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Answer (3 marks)

16 (a) Work out $8^{\frac{2}{3}}$

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Answer (2 marks)

(b) Work out $64^{-\frac{1}{3}}$

Give your answer as a fraction.

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Answer (2 marks)

END OF QUESTIONS