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For Examiner's Use

General Certificate of Secondary Education
November 2008



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

43003/HA
H

Thursday 13 November 2008 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		2–3	
4–5		4–5	
6		6	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

Time allowed for Section A: 40 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 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.



N 0 V 0 8 4 3 0 0 3 H A 0 1

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

1 Blushing Pink paint is made by mixing red and white paint.
The ratio of red paint to white paint used is 3 : 1

1 (a) What percentage of Blushing Pink is red paint?

.....
.....

Answer % (2 marks)

1 (b) How much red paint is needed to make 20 000 litres of Blushing Pink?

.....
.....

Answer litres (2 marks)

2 Use your calculator to work out $\frac{74 \times 89}{194 - 58}$

2 (a) Write down your full calculator display.

Answer (1 mark)

2 (b) Write your answer to part (a) to three significant figures.

Answer (1 mark)



- 3 (a) The price of a mobile phone is £68.
In a sale the price is decreased by 15%.

Work out the price of the mobile phone in the sale.

.....

.....

.....

Answer £ (3 marks)

- 3 (b) The number of phones sold increased from 80 to 108.

Work out the percentage increase.

.....

.....

.....

Answer % (3 marks)

- 4 Paula goes for a 30-minute run.
For the first 20 minutes she runs at an average speed of 9 miles per hour.
In the next 10 minutes she runs a distance of 1 mile.

Work out the average speed for her 30-minute run.
Give your answer in miles per hour.

.....

.....

.....

.....

Answer mph (4 marks)



5 (a) Explain why 36×10^{18} is **not** in standard form.

.....
.....

(1 mark)

5 (b) The mass of Saturn is 5.7×10^{26} kilograms.
The mass of Uranus is 8.7×10^{25} kilograms.
Saturn is heavier than Uranus.

How many times heavier?
Give your answer to an appropriate degree of accuracy.

.....
.....

Answer (3 marks)

6 Find the least common multiple (LCM) of 16 and 36.

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

Answer (2 marks)



7 The mass M kg of a sphere is directly proportional to the cube of its radius r cm.
A sphere of radius 8 cm has a mass of 128 kg.

7 (a) Find an equation connecting M and r .

.....

Answer (3 marks)

7 (b) Work out the mass of a sphere that has a radius of 10 cm.

.....

Answer kg (2 marks)

8 You are given that $0.\dot{7} = \frac{7}{9}$ and $0.\dot{4} = \frac{4}{9}$

Work out $0.0\dot{7} + 0.\dot{8}$

Give your answer as a single fraction.

.....

Answer (2 marks)



- 9 The number of mince pies sold by a bakery increases by 60% in December compared to November.
The number of mince pies sold in January is the same as the number sold in November.

Work out the percentage decrease in sales for January compared to December.

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

Answer % (3 marks)

END OF SECTION A

3



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General Certificate of Secondary Education
November 2008



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

43003/HB

H

Thursday 13 November 2008 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 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 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.



N 0 V 0 8 4 3 0 0 3 H B 0 1

APW/Nov08/43003/HB

43003/HB

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

- 10** Estimate the value of $\frac{39.87}{0.49}$

.....
.....

Answer (2 marks)

- 11** Explain why the difference of the squares of two odd integers is always even.

.....
.....

(2 marks)

- 12** (a) Given that $\frac{4183}{47} = 89$

write down the value of $\frac{89 \times 47}{4183}$

.....

Answer (1 mark)

- 12** (b) Given that $6.42 \times 54 = 346.68$

work out the value of 6.42×53

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

Answer (2 marks)

- 12** (c) Given that $8.6 \times 63 = 541.8$

write down the value of 4.3×126

.....

Answer (1 mark)



13 (a) Work out $\frac{3}{4}$ multiplied by 7.

.....
.....

Answer (2 marks)

13 (b) Work out $3\frac{2}{3} + 1\frac{1}{2}$

Give your answer as a mixed number in its simplest form.

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

Answer (3 marks)

Turn over for the next question

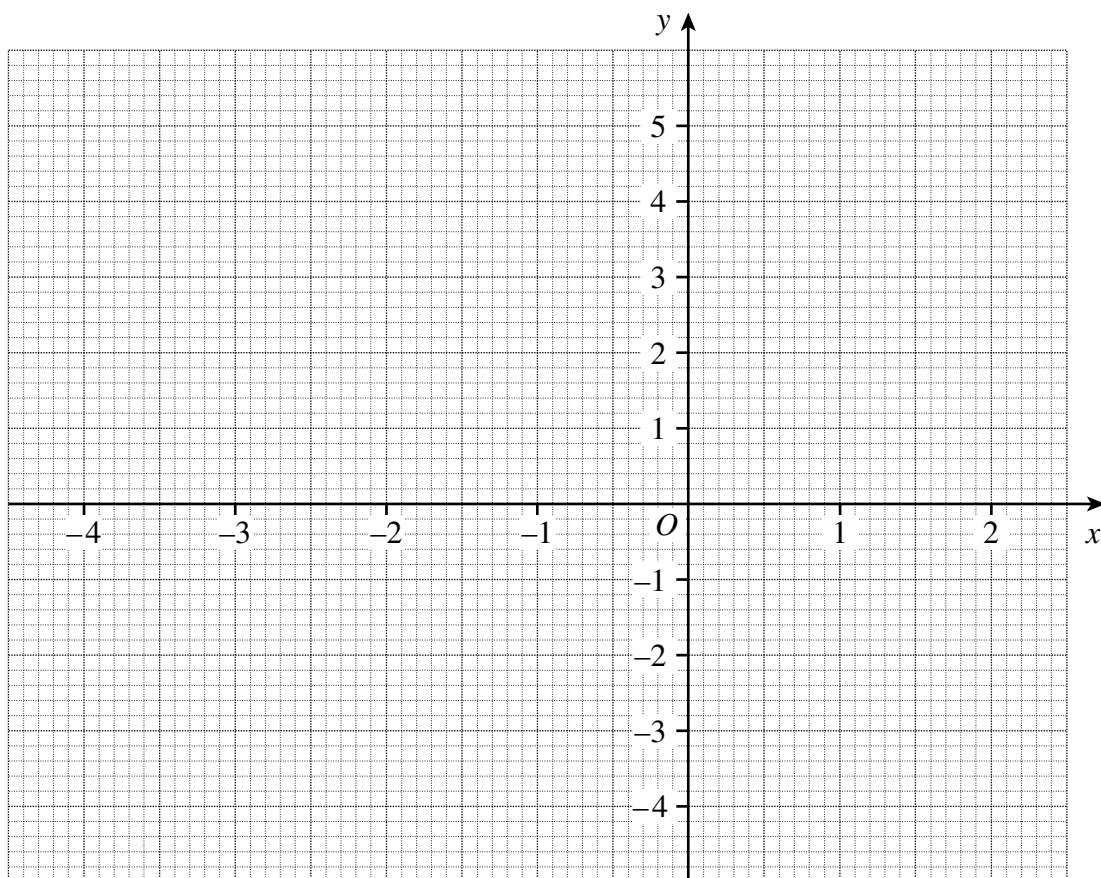


- 14 (a) Complete the table of values for $y = (x + 3)(x - 1)$

x	-4	-3	-2	-1	0	1	2
y	5	0	-3		-3	0	5

.....
(1 mark)

- 14 (b) On the grid draw the graph of $y = (x + 3)(x - 1)$ for values of x from -4 to 2.



(2 marks)



14 (c) By drawing an appropriate linear graph on the grid, solve

$$(x + 3)(x - 1) = x + 1$$

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

Answer (2 marks)

15 (a) Write down the value of 2^0

Answer (1 mark)

15 (b) Simplify $7^{18} \div (7^3)^2$

Give your answer as a power of 7.

.....
.....

Answer (2 marks)

15 (c) Write 0.000 065 in standard form.

.....

Answer (1 mark)

16 In a school $\frac{1}{12}$ of the teachers watch reality television.

There are 77 teachers who do **not** watch reality television.

Work out the number of teachers at the school.

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

Answer (3 marks)



17 Kassim is 157 centimetres tall to the nearest centimetre.
Grace is 143 centimetres tall to the nearest centimetre.

Work out the greatest possible difference in their heights.

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

Answer cm (2 marks)

18 (a) Show that $\sqrt{27} + \sqrt{12} = 5\sqrt{3}$

.....
.....

(2 marks)

18 (b) Given that $(\sqrt{27} + \sqrt{12})^{-1} = \frac{\sqrt{a}}{b}$ where a and b are integers, find the values of a and b .

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

Answer $a =$ $b =$ (3 marks)

END OF QUESTIONS



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