

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

Leave blank
-------------

General Certificate of Secondary Education  
March 2005



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

**33003/HA**

**H**

Monday 28 February 2005 9.00 am to 9.40 am

<p><b>In addition to this paper you will require:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• mathematical instruments</li> <li>• a treasury tag.</li> </ul>	
---	--

For Examiner's Use			
Section A		Section B	
Pages	Mark	Pages	Mark
2 – 3		3	
4 – 5		4 – 5	
6		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 Find the value of  $\sqrt{29.1^2 - 17.82^2}$

(a) Write down your full calculator display.

.....

Answer ..... (1 mark)

(b) Write your answer to 3 significant figures.

.....

Answer ..... (1 mark)

2 Karl was given £3.20 pocket money each week in 2004.  
In 2005, his pocket money was increased to £3.90 each week.

Calculate the percentage increase in Karl's pocket money.

.....

.....

.....

Answer ..... % (3 marks)

- 3 (a) Express 108 as a product of its prime factors.  
Give your answer in index form.

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

Answer ..... (3 marks)

- (b) Find the Highest Common Factor (HCF) of 108 and 72.

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

Answer ..... (2 marks)

**TURN OVER FOR THE NEXT QUESTION**

4 One chain of supermarkets in the UK sells 160 million bags of grapes each year.

Taking one year to be 365 days, how many bags of grapes on average does the chain of supermarkets sell each day?  
Give your answer in standard form.

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

Answer ..... (3 marks)

5 The number of tissues in a packet is reduced by 20%.  
The packet now contains 120 tissues.

How many tissues were there in a packet before the 20% reduction?

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

Answer ..... (3 marks)

6 Explain why the product of any three consecutive numbers is always divisible by six.

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

(2 marks)

7 The volume,  $V$  cubic metres, of a hot-air balloon is proportional to the cube of its height,  $h$  metres.  
A balloon with a height of 10 metres has a volume of 500 cubic metres.

(a) Find an equation connecting  $V$  and  $h$ .

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

Answer ..... (3 marks)

(b) Find the volume of a hot-air balloon which has a height of 30 metres.

.....  
.....

Answer ..... cubic metres (1 mark)

(c) Another hot-air balloon has a volume of 5000 cubic metres.  
Find its height.

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

Answer ..... metres (3 marks)

8 Rationalise the denominator and simplify fully  $\frac{18}{\sqrt{2}}$

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

Answer ..... (2 marks)

9 John is telling a friend that he had a lorry load of top soil delivered for his garden.  
He says that he had about 4 cubic metres delivered and that, with VAT, he paid about £80.

The volume is given to the nearest cubic metre.

The cost is given to the nearest £5.

Find the maximum price that John could have paid for one cubic metre of top soil.

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

Answer £ ..... (5 marks)

**END OF SECTION A**

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

General Certificate of Secondary Education  
March 2005



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

**33003/HB**

**H**

Monday 28 February 2005 9.45 am to 10.25 am

<p><b>In addition to this paper you will require:</b> mathematical instruments. You must <b>not</b> use a calculator.</p>	
---	--

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.

**NO QUESTIONS APPEAR ON THIS PAGE**



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

- 10** On one day Sara sold chocolate ice creams and vanilla ice creams in the ratio 3 : 5  
She sold a total of 72 ice creams.

How many more vanilla ice creams than chocolate ice creams did she sell?

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

Answer ..... (3 marks)

- 11** Use the calculation

$$294 \times 4.57 = 1343.58$$

to find the value of

(a)  $294 \times 0.00457$

.....

Answer ..... (1 mark)

(b)  $134\,358 \div 29.4$

.....

Answer ..... (1 mark)

Turn over 

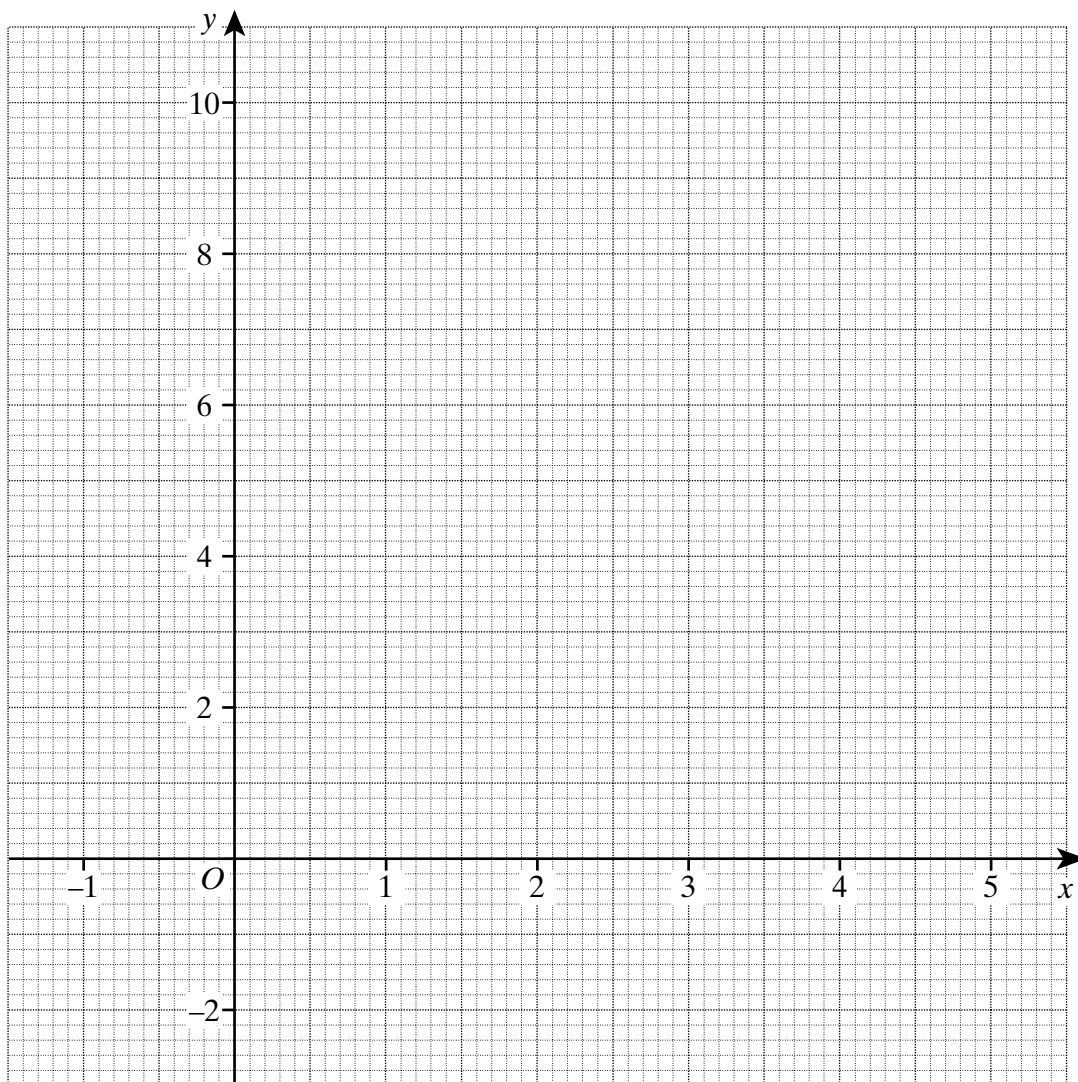


- 12 (a) Complete the table of values for  $y = x^2 - 4x + 3$

$x$	-1	0	1	2	3	4	5
$y$	8	3	0				

(2 marks)

- (b) On the grid below, draw the graph of  $y = x^2 - 4x + 3$  for values of  $x$  between -1 and +5.



(2 marks)

(c) Find, graphically, the solutions of  $x^2 - 4x + 3 = x - 3$

.....

Answer ..... (3 marks)

13 (a) Add  $3.4 \times 10^5$  and  $9.5 \times 10^5$   
Give your answer in standard form.

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

Answer ..... (2 marks)

(b) Multiply  $4 \times 10^8$  and  $1.6 \times 10^{-5}$   
Give your answer in standard form.

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

Answer ..... (2 marks)

- 14** A shop reduces the price of its dresses by 30%.  
As a result it sells 60% more dresses than last month.

Calculate the percentage increase in its takings.

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

Answer ..... % (4 marks)

- 15** (a) Evaluate  $49^{0.5} \times 3^{-2}$   
Give your answer as a fraction.

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

Answer ..... (3 marks)

- (b) Work out  $27^{\frac{2}{3}}$

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

Answer ..... (2 marks)

**16** (a) Write  $0.\dot{4}$  as a fraction.

.....

.....

.....

.....

Answer ..... (1 mark)

(b) Express  $0.6\dot{3}\dot{9}$  as a fraction.  
Give your answer in its simplest form.

.....

.....

.....

.....

.....

Answer ..... (3 marks)

**17** Show that  $\sqrt{12}(\sqrt{75} - \sqrt{48}) = 6$

.....

.....

.....

.....

.....

(3 marks)

**END OF QUESTIONS**