

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
<b>Section A</b>	Mark
Pages	
2-3	
4-5	
6-7	
Total Section A	
<b>Section B</b>	
Pages	Mark
2-3	
4-5	
6	
Total Section B	
<b>TOTAL</b>	



General Certificate of Secondary Education  
Higher Tier  
June 2010

# Mathematics (Modular) (Specification B)

**43053/HA**

**Module 3 Section A**

**H**

**Monday 21 June 2010 9.00 am to 9.45 am**

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• mathematical instruments</li> <li>• a treasury tag.</li> </ul>	
---	--

**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. Do not write outside the box around each page or on blank pages.
- 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 marks for questions are shown in brackets.
- The maximum mark for Section A is 35.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

**Advice**

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



J U N 1 0 4 3 0 5 3 H A 0 1

**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



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

**1** In 2008, a car salesman sold new cars and used cars in the ratio 1 : 6  
The number of used cars sold was 948.

**1 (a)** How many new cars did he sell?

.....  
.....

Answer ..... (2 marks)

**1 (b)** In 2009, the salesman sold the same number of used cars but only half the number of  
new cars as in 2008.

Work out the ratio of new cars to used cars he sold in 2009.  
Give your answer in its simplest form.

.....  
.....

Answer ..... (2 marks)

**2** You are given 1 mile per hour = 0.44 metres per second

A car travels 100 metres in 7 seconds.  
The speed limit for the road is 30 miles per hour.

Is the car travelling over the speed limit?  
You **must** show your working.

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

(4 marks)

8

Turn over ►



**3** Write 100 as the product of prime factors.  
Give your answer in index form.

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

Answer ..... (3 marks)

**4 (a)** 800 people watch a play in a theatre on the first night.  
17% fewer watch the play on the second night.

Calculate the number watching the play on the second night.

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

Answer ..... (3 marks)

**4 (b)** On the final night, the number watching the play is 270 to the nearest 10.

**4 (b) (i)** Write down the lowest number of people who could have been watching.

Answer ..... (1 mark)

**4 (b) (ii)** Write down the highest number of people who could have been watching.

Answer ..... (1 mark)



5 (a) Niles is given this question.

Expand and simplify  $(x - 5)(x - 6)$

Here is his answer.

$$\begin{aligned}(x - 5)(x - 6) &= x^2 - 5x - 6x - 11 \\ &= x^2 + 11x - 11\end{aligned}$$

He has made **two** mistakes.

Identify and correct his mistakes.

Mistake 1 .....

.....

Mistake 2 .....

.....

(2 marks)

5 (b) Explain why the expression  $5x - 6y$  will **not** factorise.

.....

.....

(1 mark)

6 (a) Write 435 million in standard form.

.....

Answer ..... (1 mark)

6 (b) Work out the cube root of 435 million.

6 (b) (i) Write down your full calculator display.

Answer ..... (1 mark)

6 (b) (ii) Write your answer to 2 significant figures.

Answer ..... (1 mark)



7 Here is a table of values for the equation  $y = x^2 + 3x - 5$

$x$	-5	-4	-3	-2	-1	0	1	2
$y$	5	-1	-5	-7	-7	-5	-1	5

7 (a) Explain what you know about the values of  $y$  for

7 (a) (i) values of  $x$  greater than 2

Answer .....

.....

(1 mark)

7 (a) (ii) values of  $x$  between -2 and -1.

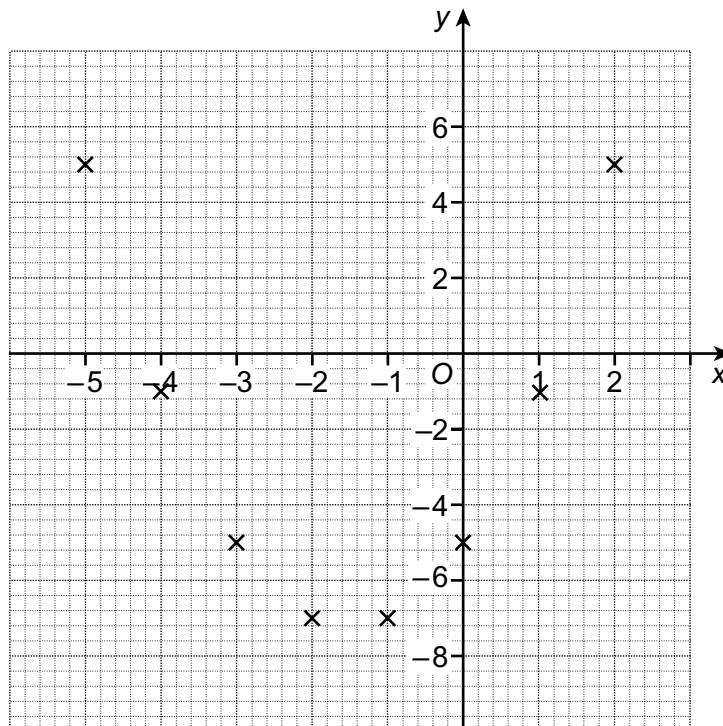
Answer .....

.....

(1 mark)

7 (b) The points for the graph of  $y = x^2 + 3x - 5$  for values of  $x$  from -5 to 2 have been plotted on the grid.

Complete the graph.



(1 mark)



7 (c) By drawing a suitable linear graph on the grid solve the equation  $x^2 + 2x - 7 = 0$

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

Answer ..... (3 marks)

8 The time,  $T$  days, taken to build a house is inversely proportional to the number of builders,  $N$ , working on the house.  
8 builders take 25 days to build a house.

Find an equation connecting  $N$  and  $T$ .

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

Answer ..... (3 marks)

9 In a town 97% of the population has Internet access.  
Of those with Internet access, 48% have broadband.  
28 400 have broadband.

Work out the population of the town.  
Give your answer to a suitable degree of accuracy.

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

Answer ..... (4 marks)

**END OF SECTION A**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

