Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
June 2004

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

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

H

Wednesday 30 June 2004 9.00 am to 9.40 am

In addition to this paper you will require:
 • a calculator
 • mathematical instruments
 • a treasury tag.

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.

33003/HA

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

1 Use your calculator to find the value of

$$\frac{\sqrt{18.31}}{9.41 + 4.47}$$

....

....

....

Answer .... *(2 marks)*

2 Mike bought 400 books for £150 to sell at a Saturday market.
He sold the books for £281.

What was Mike's percentage profit?

....

....

Answer ....% *(3 marks)*

3 Derek begins an experiment growing bacteria in a laboratory.
He starts with a mass of 200 grams of bacteria at 1 pm on Monday.
Every day the mass of bacteria grows by 15%.

(a) Calculate the mass of bacteria at 1 pm on Tuesday.

....

....

....

....

Answer .... grams   *(2 marks)*

(b) Calculate how many days it takes for the mass of bacteria to double.

....

....

....

....

Answer ....   *(3 marks)*

4 In Portugal, Brian spends €2.80 on ice cream.
This price includes VAT which is 12% in Portugal.

Find the amount of VAT which Brian paid.

....

....

....

....

Answer € ....   *(3 marks)*

Turn over ▶

13

5 Americans eat 1.6×10^{10} quarts of popcorn a year.
The population of America is 276 million people.

How many quarts of popcorn on average does an American eat per year?

....

....

....

Answer ....   *(3 marks)*

6 Mark's height is 203 cm and Eileen's height is 185 cm.
Both heights are given to the nearest cm.

Find the maximum possible difference between the two heights.

....

....

....

....

Answer .... cm   *(2 marks)*

7 Prove that $\quad 0.4\dot{7} = \dfrac{43}{90}$

....

....

....

....

....

(3 marks)

8 The volume, *v* litres, which a fixed mass of gas occupies, is inversely proportional to its pressure, *p* pascals.
When the pressure is 150 000 pascals, its volume is 5 litres.

(a) Find an equation connecting *v* and *p*.

....

....

....

....

Answer .... *(3 marks)*

(b) Find the volume of the gas when the pressure is 250 000 pascals.

....

....

....

Answer .... litres *(1 mark)*

(c) Find the pressure of the gas when its volume is 300 litres.

....

....

....

....

Answer .... pascals *(2 marks)*

Turn over ▶

9 Carol made two trips to the USA.
In 2002 she found that the price of a pair of jeans, in dollars, was 18% less than it was in 2001.

However, the exchange rate had changed.

Year	Exchange rate
2001	$1.42 to £1
2002	$1.64 to £1

Find the percentage reduction in the price, in £, of the jeans.

....

....

....

....

....

....

....

....

....

....

Answer ....% *(5 marks)*

END OF SECTION A

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE