Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
June 2005

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

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

Wednesday 29 June 2005 9.00 am to 9.40 am

H

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.

For Examiner's Use			
Section A		**Section B**	
Pages	Mark	Pages	Mark
2 – 3		**2 – 3**	
4 – 5		**4 – 5**	
6 – 7		**6 – 7**	
8			
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

33003/HA

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

1 Sue's dog weighed 60 pounds.
The vet said the dog must lose 15% of its weight.
Sue's dog now weighs 53 pounds.

Does Sue's dog need to lose more weight?
You **must** show all your working.

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(3 marks)

2 A school spends £279 000 a year.
This is divided between staff salaries and other costs in the ratio 7 : 2

How much is spent on staff salaries?

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Answer £ .... *(2 marks)*

3 (a) Rob invested £2500 in a building society account at 2% per year compound interest.

Calculate the total amount in the account after three years.

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Answer £ .... *(3 marks)*

(b) Jane invested some money in a building society account.
Interest of 3% was added to the account after one year.
The total in the account after the interest was added was £221.45

How much money did Jane invest?

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....

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Answer £ .... *(3 marks)*

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

4 The table shows the mass of 9 planets.

Planet	Mass of Planet (kg)
Mercury	3.3×10^{23}
Venus	4.9×10^{24}
Earth	6.0×10^{24}
Mars	6.4×10^{23}
Jupiter	1.9×10^{27}
Saturn	5.7×10^{26}
Uranus	8.7×10^{25}
Neptune	1.0×10^{26}
Pluto	1.5×10^{22}

(a) Which planet is the heaviest?

Answer .... *(1 mark)*

(b) Chris says that Earth is approximately 1.8 times as heavy as Mercury.

Is he correct?
You **must** explain your answer.

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(2 marks)

(c) The population of the Earth is 6530 million.

Write 6530 million in standard form.

....

Answer .... *(1 mark)*

(d) The diameter of Neptune is 4.86×10^4 km.
The diameter of Pluto is 2.27×10^3 km.

Express the diameter of Neptune to the diameter of Pluto as a ratio in the form $n:1$
Give your answer to a suitable degree of accuracy.

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Answer .... *(3 marks)*

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

5 Nut toffees weigh 9 grams each, correct to the nearest gram.

(a) What is the minimum possible weight of 10 nut toffees?

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....

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

(b) Treacle toffees weigh 8 grams each, correct to the nearest gram.
10 nut toffees and 10 treacle toffees are put into a bag.
The manufacturer says, "This bag contains at least 162 grams of toffees."

Is this correct?
Explain your answer carefully.

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(2 marks)

6 A stone is dropped from rest and falls *d* metres in *t* seconds.
The distance the stone falls is proportional to the square of the time it takes to fall.
The stone falls 490 metres in 10 seconds.

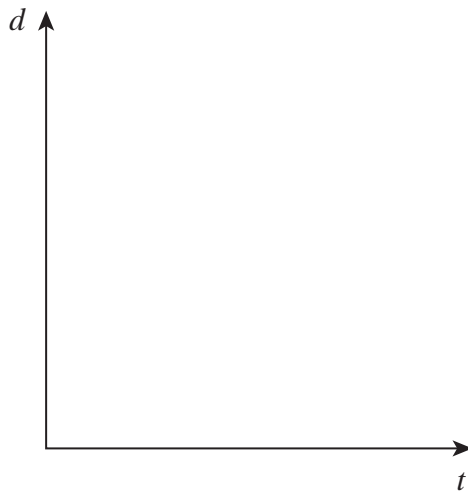(a) Find an equation connecting *d* and *t*.

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Answer *d* = ... *(3 marks)*

(b) How far does the stone fall in 2.5 seconds?

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Answer .... metres *(1 mark)*

(c) Sketch a graph of *d* against *t*.

d

t

(1 mark)

TURN OVER FOR THE NEXT QUESTION

APW/6Q05/33003/HA

7 Use your calculator to work out the value of

(a) $729^{\frac{3}{2}}$

Answer .... *(1 mark)*

(b) $1024^{-0.5}$

Answer .... *(1 mark)*

8 There is a 3-stage selection procedure for places on a university course.
The table shows the percentage of candidates who pass each stage.
Candidates who do not pass a stage do not go on to the next stage.

Stage	Percentage of candidates who pass each stage
1	50
2	60
3	x

The percentage of candidates that pass all three stages is 25.5%

Find the value of x.

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Answer .... *(3 marks)*

END OF SECTION A