Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
November 2003

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

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Wednesday 19 November 2003 9.00 am to 9.40 am

H

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

	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, make sure that you hand in **both** Section A and Section B securely tagged 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 Calculate the value of

$$\frac{17.32 + 14.29}{4.18 - 1.97}$$

Give your answer to three significant figures.

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Answer .... *(3 marks)*

2 A shop advertises a special offer.

Portable Television

Was £90

Now £69
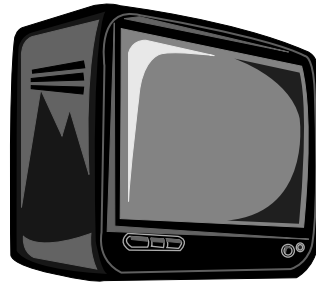
Find the percentage reduction in the cost of the television.

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

3 (a) Clare bought a cello for £1300.
After one year its value increased by 4%.

Find the value of the cello after one year.

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Answer £ ....   *(2 marks)*

(b) Ben bought a violin for £1700.
In each year the value of the violin increases by 12% of its value at the start of that year.

Calculate after how many complete years the value of the violin will be at least £2600.

You **must** show all your working.

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Answer .... years   *(4 marks)*

Turn over ▶

4   Calculate the value of

(a) $8490 \times 3.7 \times 10^4$

Give your answer in standard form.

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Answer ....   *(2 marks)*

(b) $\dfrac{8490}{3.7 \times 10^4}$

Give your answer in standard form.

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Answer ....   *(2 marks)*

5 Cheese is sold in different sizes.
The weight of each cheese, W kilograms, is proportional to the cube of its height, h centimetres.
A cheese of weight 10 kg has a height of 12 cm.

(a) Find an equation connecting W and h.

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Answer .... *(3 marks)*

(b) Another cheese has a height of 6 cm.

Find its weight.

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Answer .... kg *(1 mark)*

(c) Find the height of a cheese that has a weight of 20 kg.

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Answer .... cm *(3 marks)*

Turn over ▶

6 A reservoir, in the shape of a cuboid, is 190 metres long and 80 metres wide.
On one day 3.7 inches of rain fell on the reservoir.

These measurements are all given correct to two significant figures.

What is the maximum possible volume of rain which could have fallen on the reservoir during that day?
Give your answer in cubic metres correct to **four** significant figures.

Use 2.54 centimetres to be exactly 1 inch.

The volume of a cuboid is length × width × depth.

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Answer .... cubic metres   *(6 marks)*

7 Show that $\left(\sqrt{48} + \sqrt{24}\right)^2$ can be expressed in the form $p + q\sqrt{2}$
where p and q are integers to be found.

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Answer ....   *(3 marks)*

END OF SECTION A

General Certificate of Secondary Education
November 2003

MATHEMATICS (MODULAR) (SPECIFICATION B)   **33003/HB**
Module 3 Higher Tier Section B

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Wednesday 19 November 2003 9.45 am to 10.25 am

H

In addition to this paper you will require:
  mathematical instruments.
You must **not** use a calculator.

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, make sure that you hand in **both** Section A and Section B securely tagged 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.

33003/HB

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

8 (a) Express 24 as a product of its prime factors.

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Answer .... *(2 marks)*

(b) Find the Least Common Multiple (LCM) of 24 and 60.

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Answer .... *(2 marks)*

9 Two friends agree to share £42 in the ratio 3 : 4

How much is the smaller share?

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Answer £ .... *(2 marks)*

Turn over ▶

10 (a) Complete the table of values for $y = x^2 - 2x - 3$.

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

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(2 marks)

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

(c) Write down the solutions of $\qquad x^2 - 2x - 3 = 0$

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Answer .... *(1 mark)*

(d) By drawing an appropriate linear graph, write down the solutions of

$$x^2 - x - 4 = 0$$

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Answer .... *(3 marks)*
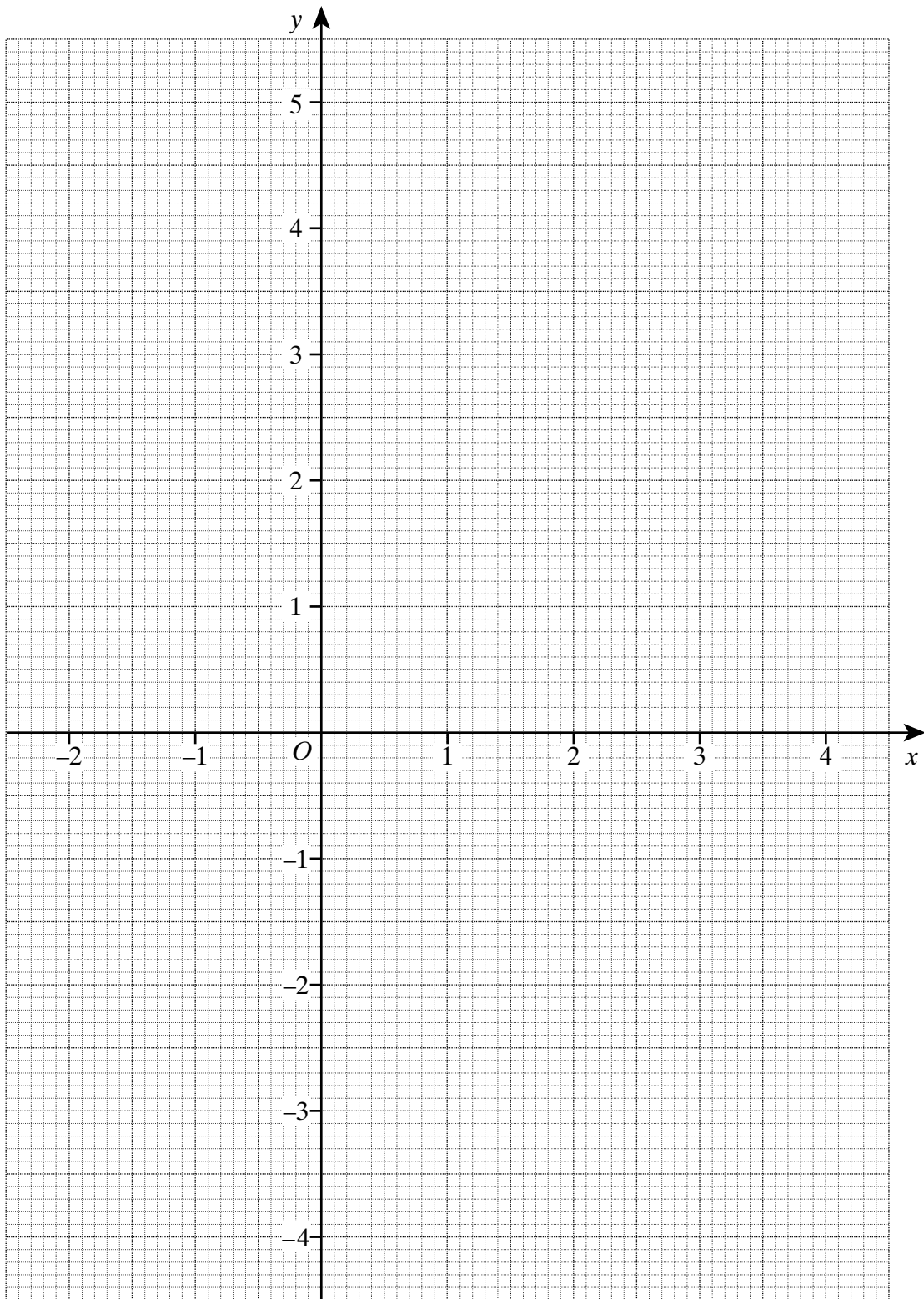
(2 marks)

Turn over ▶

11 A market trader reduces the price of a T-shirt by 20%.
After this reduction, the selling price is £4.80

How much was the reduction in the price of the T-shirt?

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Answer £ .... *(3 marks)*

12 (a) Find the value of $4\frac{2}{3} - 2\frac{3}{4}$

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Answer .... *(3 marks)*

(b) Calculate the value of $64^{-\frac{1}{2}}$, giving your answer as a fraction in its simplest form.

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Answer .... *(2 marks)*

(c) Write 32 in the form 4^{b}

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Answer .... *(2 marks)*

13 A shopkeeper normally sells a dress at 60% more than his cost price of £80.
In a sale the price of the dress is reduced until it is only 10% more than his cost price.

By what percentage of the original selling price has the price of the dress been reduced?

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

14 (a) Simplify fully the following expression, leaving your answer in surd form.

$$\sqrt{75} - \sqrt{12}$$

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Answer .... *(2 marks)*

(b) Given that $135 = 3^3 \times 5,$

simplify the expression $\dfrac{\sqrt{135}}{\sqrt{75} - \sqrt{12}}$

Give your answer in surd form.

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Answer .... *(3 marks)*

END OF QUESTIONS