Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

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General Certificate of Secondary Education
June 2006

ASSESSMENT and QUALIFICATIONS ALLIANCE

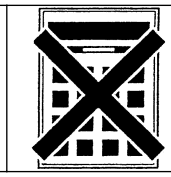
MATHEMATICS (MODULAR) (SPECIFICATION B) 33003/HB
Module 3 Higher Tier Section B

H

Wednesday 28 June 2006 9.45 am to 10.25 am

For this paper you must have:
- 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.
- Answer the questions in the spaces provided.
- Do all rough work in this book.
- 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.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

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

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

8 (a) You are given that $24 = 2^3 \times 3$

Write each of the following as the product of prime factors in index form.

(i) 48

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

(ii) 240

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

(b) What is the least common multiple (LCM) of 24 and 32?

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

(c) What is the highest common factor (HCF) of 24 and 32?

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

9 (a) Work out $2\frac{1}{4} \times 1\frac{3}{7}$

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

(b) What number when multiplied by $\frac{2}{5}$ gives an answer of 1?

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

10 Which **two** of the following fractions are recurring decimals?

$\frac{1}{3}$ $\frac{4}{5}$ $\frac{3}{8}$ $\frac{3}{4}$ $\frac{5}{7}$

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Answer ..... and ..... *(2 marks)*

11

11 A toy rabbit works using a single battery.
When the battery is new, it has 250 units of power.
After every hour of use the battery loses 20% of its remaining power.

(a) How many units of power remain in the battery after 2 hours?

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Answer ..... units *(2 marks)*

(b) The battery must have at least 100 units of power left for the toy rabbit to work.

Show that the toy rabbit will still be working after 4 hours.

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(3 marks)

12 Evaluate $4^0 + 10^{-1} \times 125^{\frac{1}{3}}$

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

13 (a) Express $0.\dot{8}\dot{4}$ as a fraction.

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

(b) Express $0.0\dot{8}\dot{4}$ as a fraction in its simplest form.

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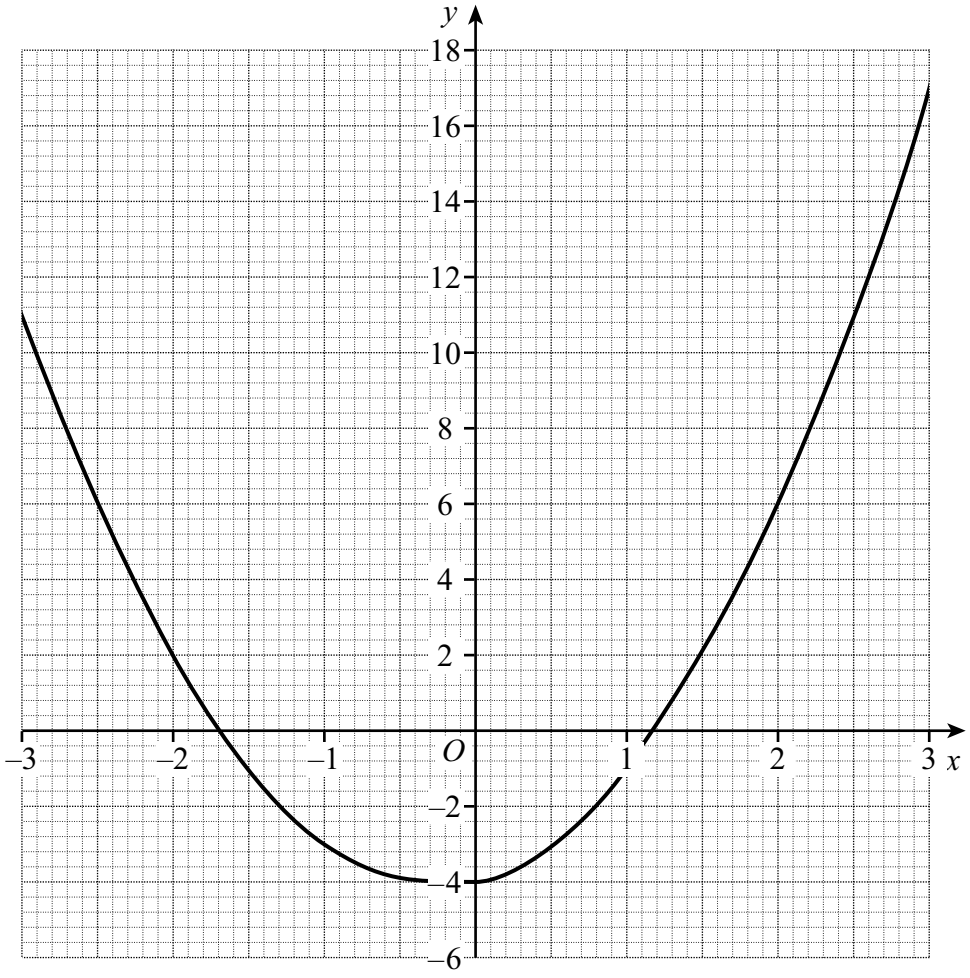
Answer ..... *(1 mark)*

12

14 The graph of $y = 2x^2 + x - 4$ is shown.



(a) Use the graph to find the negative solution of the equation $2x^2 + x = 4$

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

(b) By drawing a suitable straight line on the graph, find solutions to the equation $2x^2 - x - 5 = 0$

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

15 Given that $p = \sqrt{3}$ $q = \sqrt{12}$ $r = \sqrt{6}$

(a) find the value of $(pq)^{-1}$

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

(b) show that $(r - p)^2 = 9 - 6\sqrt{2}$

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(3 marks)

END OF QUESTIONS

9

There are no questions printed on this page