

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

General Certificate of Secondary Education
June 2005



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

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Wednesday 29 June 2005 9.45 am to 10.25 am

<p>In addition to this paper you will require: mathematical instruments. You must not use a calculator.</p>	
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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 tag Section A and Section B 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.

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

- 9 (a) Write down the reciprocal of 0.2

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Answer (2 marks)

- (b) Fill in the boxes to make these statements correct.

(i) $\frac{1}{5} \times \boxed{} = 1$

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(1 mark)

(ii) $\frac{3}{4} \times \frac{\boxed{}}{\boxed{}} = 1$

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(1 mark)

10 Estimate the value of $\frac{505.3 \times 1.9}{43.93 + 58.2}$

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Answer (2 marks)

11 (a) Write 36 as the product of its prime factors.

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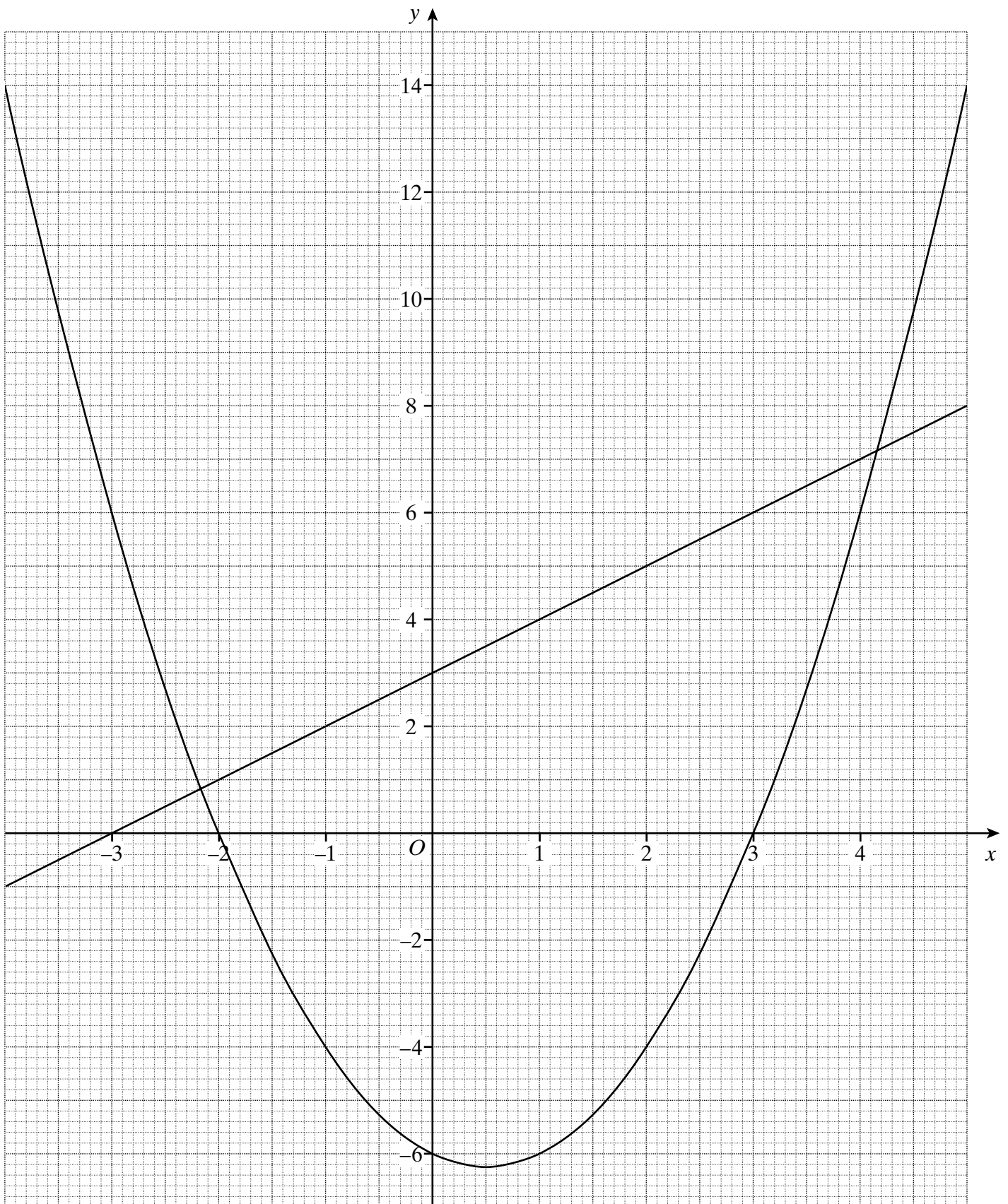
Answer (2 marks)

(b) What is the least common multiple (LCM) of 36 and 45?

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Answer (2 marks)

12 The diagram shows the graphs $y = x^2 - x - 6$ and $y = x + 3$



(a) Use the graph of $y = x^2 - x - 6$ to write down the solutions of the equations

(i) $x^2 - x - 6 = 0$

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Answer (1 mark)

(ii) $x^2 - x - 6 = -2$

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Answer (2 marks)

(b) Find the quadratic equation whose solutions are the x -coordinates of the points of intersection of

$$y = x^2 - x - 6 \text{ and } y = x + 3$$

Give your answer in the form $x^2 + bx + c = 0$

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Answer (2 marks)

(c) Find the equation of the straight line that should be drawn on the diagram to solve the equation

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

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Answer (2 marks)

7

Turn over ►

- 13** (a) Rationalise the denominator of $\frac{18}{\sqrt{3}}$ and simplify your answer fully.

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Answer (2 marks)

- (b) Show that $100^{\frac{1}{4}}$ lies between 3 and 4.

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(2 marks)

- 14** (a) Which of these fractions can be written as recurring decimals?

$$\frac{1}{5} \quad \frac{1}{6} \quad \frac{5}{8} \quad \frac{2}{3}$$

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Answer (2 marks)

- (b) Express $\frac{2}{9}$ as a recurring decimal.

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Answer (1 mark)

(c) Prove that $0.\dot{1}5\dot{4}$ is equal to $\frac{17}{110}$

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(3 marks)

15 (a) Express $\sqrt{5} + \sqrt{20}$ in the form $p\sqrt{5}$

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Answer (2 marks)

(b) Hence, or otherwise, simplify fully $\frac{\sqrt{5} + \sqrt{20}}{\sqrt{45} - \sqrt{20}}$

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Answer (3 marks)

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE