

Write your name here

Surname

Other names

**Pearson Edexcel**  
**International**  
**Advanced Level**

Centre Number

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Candidate Number

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# Core Mathematics C12

## Advanced Subsidiary

Monday 13 January 2014 – Morning  
**Time: 2 hours 30 minutes**

Paper Reference  
**WMA01/01**

**You must have:**  
Mathematical Formulae and Statistical Tables (Blue)

Total Marks

**Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.**

### Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B). Coloured pencils and highlighter pens must not be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- When a calculator is used, the answer should be given to an appropriate degree of accuracy.

### Information

- The total mark for this paper is 125.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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9. In the first month after opening, a mobile phone shop sold 300 phones. A model for future sales assumes that the number of phones sold will increase by 5% per month, so that  $300 \times 1.05$  will be sold in the second month,  $300 \times 1.05^2$  in the third month, and so on.

Using this model, calculate

- (a) the number of phones sold in the 24th month, (2)

- (b) the total number of phones sold over the whole 24 months. (2)

This model predicts that, in the  $N$ th month, the number of phones sold in that month exceeds 3000 for the first time.

- (c) Find the value of  $N$ . (3)

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Question 9 continued

Lined writing area for the answer to Question 9.

(Total 7 marks)

Q9

Small rectangular box for marking the answer to Q9.



10. The curve  $C$  has equation  $y = \cos\left(x - \frac{\pi}{3}\right)$ ,  $0 \leq x \leq 2\pi$

(a) In the space below, sketch the curve  $C$ . (2)

(b) Write down the exact coordinates of the points at which  $C$  meets the coordinate axes. (3)

(c) Solve, for  $x$  in the interval  $0 \leq x \leq 2\pi$ ,

$$\cos\left(x - \frac{\pi}{3}\right) = \frac{1}{\sqrt{2}}$$

giving your answers in the form  $k\pi$ , where  $k$  is a rational number. (4)









































15.

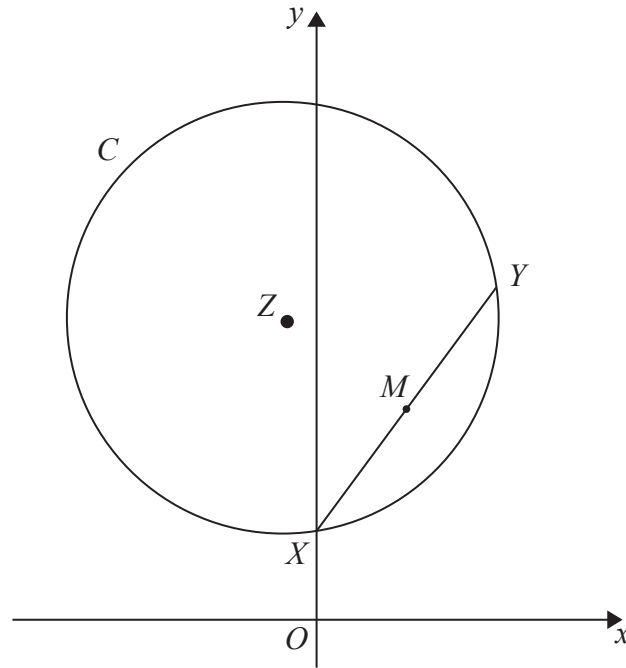


Diagram **NOT** drawn to scale

**Figure 3**

The points  $X$  and  $Y$  have coordinates  $(0, 3)$  and  $(6, 11)$  respectively.  $XY$  is a chord of a circle  $C$  with centre  $Z$ , as shown in Figure 3.

- (a) Find the gradient of  $XY$ . (2)

The point  $M$  is the midpoint of  $XY$ .

- (b) Find an equation for the line which passes through  $Z$  and  $M$ . (5)

Given that the  $y$  coordinate of  $Z$  is 10,

- (c) find the  $x$  coordinate of  $Z$ , (2)

- (d) find the equation of the circle  $C$ , giving your answer in the form

$$x^2 + y^2 + ax + by + c = 0$$

where  $a$ ,  $b$  and  $c$  are constants. (5)

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