

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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PEARSON

(Total 4 marks)



2.

$$f(x) = \frac{8}{x^2} - 4\sqrt{x} + 3x - 1, \quad x > 0$$

Giving your answers in their simplest form, find

(a) $f'(x)$

(3)

$$(b) \int f(x) dx$$

(4)

[illegible]

Q2

Q3



4. Answer this question without the use of a calculator and show all your working.

(i) Show that

$$\frac{4}{2\sqrt{2} - \sqrt{6}} = 2\sqrt{2}(2 + \sqrt{3})$$

(4)

(ii) Show that

$$\sqrt{27} + \sqrt{21} \times \sqrt{7} - \frac{6}{\sqrt{3}} = 8\sqrt{3}$$

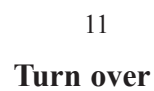
(3)



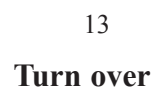
Q4



(Total 7 marks)

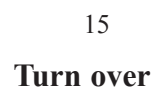


(Total 6 marks)





(Total 5 marks)



Q8

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

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

(c) Find the value of N . **(3)**

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This image shows a full page of blank, lined paper. It features approximately 28 horizontal grey lines spaced evenly apart, typical of standard notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings present.

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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)



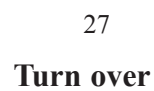
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[illegible]

Q10



(Total 8 marks)



12.

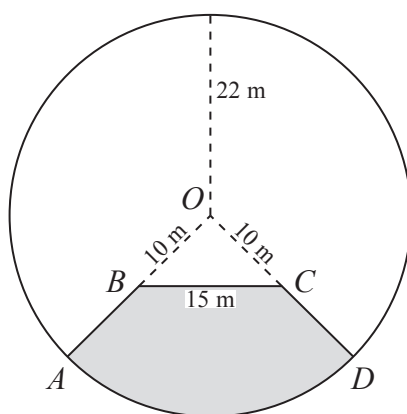


Diagram **NOT**
drawn to scale

Figure 1

Figure 1 shows the plan for a pond and platform. The platform is shown shaded in the figure and is labelled $ABCD$.

The pond and platform together form a circle of radius 22 m with centre O .

OA and OD are radii of the circle. Point B lies on OA such that the length of OB is 10 m and point C lies on OD such that the length of OC is 10 m. The length of BC is 15 m.

The platform is bounded by the arc AD of the circle, and the straight lines AB , BC and CD .

Find

- (a) the size of the angle BOC , giving your answer in radians to 3 decimal places, (3)
- (b) the perimeter of the platform to 3 significant figures, (4)
- (c) the area of the platform to 3 significant figures. (4)



[illegible]

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(Total 11 marks)

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(Total 14 marks)





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Question 14 continued

Lined area for writing the answer to Question 14.

Q14

(Total 12 marks)



15.

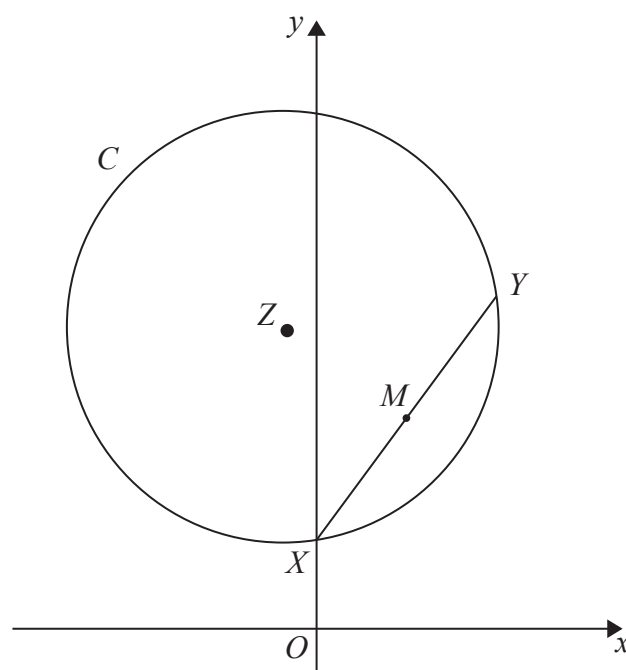


Diagram **NOT**
drawn to scale

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)



[illegible]

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Question 15 continued

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(Total 14 marks)

Q15

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TOTAL FOR PAPER: 125 MARKS

END

