

Write your name here

Surname	Other names
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Pearson Edexcel
International GCSE

Centre Number	Candidate Number									
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Further Pure Mathematics

Paper 1

Monday 19 January 2015 – Afternoon Time: 2 hours	Paper Reference 4PM0/01
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Calculators may be used.	Total Marks
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Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.

Turn over ►

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Question 3 continued

Dotted lines for writing.

(Total for Question 3 is 9 marks)



4

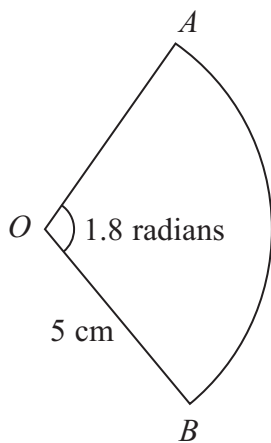


Diagram **NOT** accurately drawn

Figure 2

Figure 2 shows the sector AOB of a circle of radius 5 cm. The centre of the circle is O and the angle AOB is 1.8 radians.

- (a) Find the length of the arc AB . (1)

- (b) Find the area of the sector AOB . (2)

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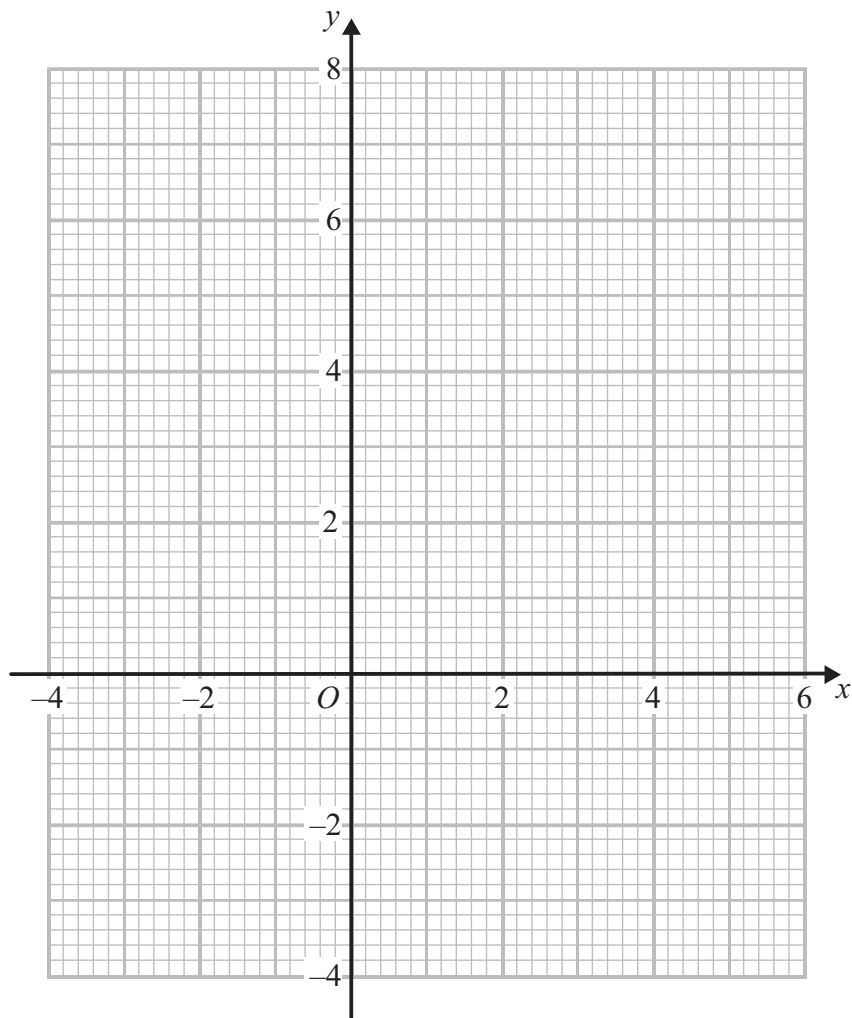
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(Total for Question 4 is 3 marks)



Question 5 continued



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(Total for Question 5 is 9 marks)

Question 6 continued

A large rectangular area containing 25 horizontal dotted lines for writing answers.



7 The curve C has equation $y = x^2 + 3$

The point A with coordinates $(0, 3)$ and the point B with coordinates $(4, 19)$ lie on C , as shown below in Figure 3.

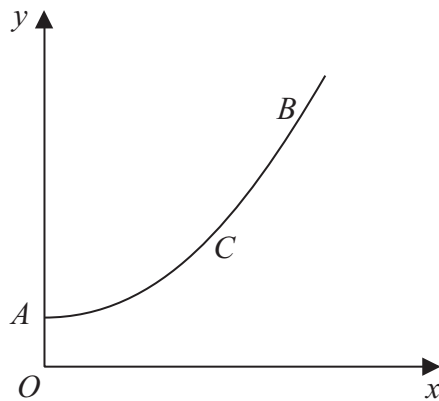


Figure 3

The finite area enclosed by the arc AB of curve C , the axes and the line with equation $x = 4$ is rotated through 360° about the x -axis.

(a) Using algebraic integration, calculate, to 1 decimal place, the volume of the solid generated.

(6)

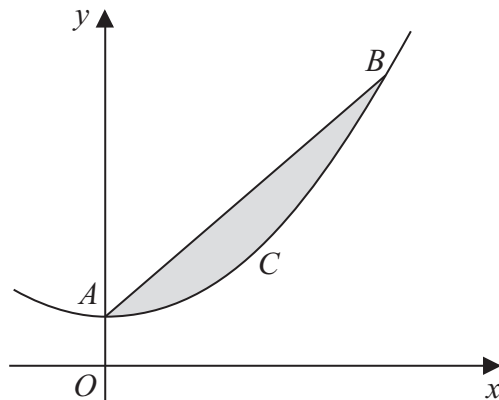


Figure 4

(b) Using algebraic integration, calculate the area of the region between the chord AB and the arc AB of C , shown shaded in Figure 4.

(6)

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Question 7 continued

A series of horizontal dotted lines for writing the answer to Question 7.



Question 7 continued

A large rectangular area with rounded corners, containing 25 horizontal dotted lines for writing.

Question 7 continued

A large rectangular area containing 25 horizontal dotted lines for writing answers.

(Total for Question 7 is 12 marks)



Question 8 continued

A large rectangular area containing 25 horizontal dotted lines for writing answers.



9

$$f(x) = 2x^3 + ax^2 + bx + 15 \quad \text{where } a \text{ and } b \text{ are constants.}$$

The remainder when $f(x)$ is divided by $(x - 1)$ is -12

The remainder when $f(x)$ is divided by $(x + 1)$ is 48

(a) Find the value of a and the value of b . (6)

(b) Show that $f\left(\frac{1}{2}\right) = 0$ (1)

(c) Express $f(x)$ as a product of linear factors. (4)

(d) Solve the equation $f(x) = 0$ (1)

Question 9 continued

A large rectangular area with rounded corners, containing 25 horizontal dotted lines for writing.

10 The points A , B and C have coordinates $(-2, 3)$, $(2, 5)$ and $(4, 1)$ respectively.

(a) Show, by calculation, that AB is perpendicular to BC . (3)

(b) Show that the length of $AB =$ the length of BC . (3)

The midpoint of AC is M .

(c) Find the coordinates of M . (1)

(d) Find the exact length of the radius of the circle which passes through the points A , B and C . (3)

The point P lies on BM such that $BP : PM = 2 : 1$

(e) Find the coordinates of P . (2)

The point Q lies on AP produced such that $AP : PQ = 2 : 1$

(f) Find the coordinates of Q . (3)

(g) Show that Q lies on BC . (3)



Question 10 continued

A large rectangular area containing 25 horizontal dotted lines for writing the answer to Question 10.

Question 10 continued

A large rectangular area containing numerous horizontal dotted lines for writing answers.



