

Write your name here

Surname	Other names
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**Pearson
Edexcel GCE**

Centre Number

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Candidate Number

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Further Pure Mathematics FP2

Advanced/Advanced Subsidiary

Wednesday 6 June 2018 – Morning
Time: 1 hour 30 minutes

Paper Reference

6668/01

You must have:

Mathematical Formulae and Statistical Tables (Pink)

Total Marks

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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 75.
- 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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Question 2 continued

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Q2

(Total 4 marks)



3. (a) By writing $\frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4}$, show that

(i) $\sin\left(\frac{\pi}{12}\right) = \frac{1}{4}(\sqrt{6} - \sqrt{2})$

(ii) $\cos\left(\frac{\pi}{12}\right) = \frac{1}{4}(\sqrt{6} + \sqrt{2})$

(4)

(b) Hence find the exact values of z for which

$$z^4 = 4\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)$$

Give your answers in the form $z = a + ib$ where $a, b \in \mathbb{R}$

(5)

Lined writing area for the student's answer.



Question 3 continued

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Lined writing area for the answer to Question 3.



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Question 4 continued

Lined writing area for the answer to Question 4.

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6. (a) Find the general solution of the differential equation

$6\frac{d^2y}{dx^2} + 5\frac{dy}{dx} - 6y = x - 6x^2$ (8)

(b) Find the particular solution for which $y = 0$ and $\frac{dy}{dx} = \frac{3}{2}$ when $x = 0$ (5)

Lined area for writing the solution to the differential equation.

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Question 6 continued

Lined area for writing the answer to Question 6.

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Question 6 continued

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Q6

(Total 13 marks)



7.

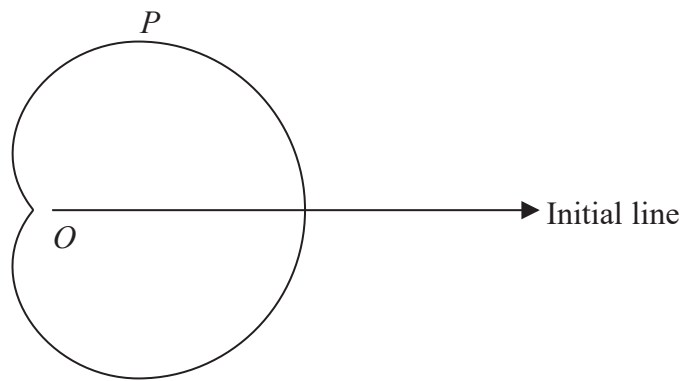


Figure 1

The curve C shown in Figure 1 has polar equation

$$r = 2 + \sqrt{3}\cos\theta, \quad 0 \leq \theta < 2\pi$$

The tangent to C at the point P is parallel to the initial line.

- (a) Show that $OP = \frac{1}{2}(3 + \sqrt{7})$ (6)
- (b) Find the exact area enclosed by the curve C . (6)





Question 7 continued

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Question 7 continued

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Lined writing area for the answer to Question 7.

(Total 12 marks)

Q7



8. (a) Using the substitution $t = x^2$, or otherwise, find

$$\int 2x^5 e^{-x^2} dx \quad (6)$$

(b) Hence find the general solution of the differential equation

$$x \frac{dy}{dx} + 4y = 2x^2 e^{-x^2}$$

giving your answer in the form $y = f(x)$. (4)

Given that $y = 0$ when $x = 1$

(c) find the particular solution of this differential equation, giving your solution in the form $y = f(x)$. (3)

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Question 8 continued

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Question 8 continued

Lined area for writing the answer to Question 8.

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Question 8 continued

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Lined area for writing the answer to Question 8.





Question 8 continued

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Q8

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(Total 13 marks)

TOTAL FOR PAPER: 75 MARKS

END

