

Write your name here

Surname

Other names

Pearson
Edexcel GCE

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--	--

Further Pure Mathematics FP1

Advanced/Advanced Subsidiary

Friday 20 May 2016 – Morning
Time: 1 hour 30 minutes

Paper Reference

6667/01

You must have:

Mathematical Formulae and Statistical Tables (Pink)

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 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 ►

P46681A

©2016 Pearson Education Ltd.

5/1/1/1/1/1/1/1/



PEARSON

Leave blank

Question 1 continued

Lined writing area for the answer to Question 1.

(Total 3 marks)

Q1

Grading box for Question 1.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



5. Points $P(ap^2, 2ap)$ and $Q(aq^2, 2aq)$, where $p^2 \neq q^2$, lie on the parabola $y^2 = 4ax$.

(a) Show that the chord PQ has equation

$$y(p + q) = 2x + 2apq \quad (5)$$

Given that this chord passes through the focus of the parabola,

(b) show that $pq = -1$ (1)

(c) Using calculus find the gradient of the tangent to the parabola at P . (2)

(d) Show that the tangent to the parabola at P and the tangent to the parabola at Q are perpendicular. (2)

DO NOT WRITE IN THIS AREA



7. A complex number z is given by

$$z = a + 2i$$

where a is a non-zero real number.

- (a) Find $z^2 + 2z$ in the form $x + iy$ where x and y are real expressions in terms of a . **(4)**

Given that $z^2 + 2z$ is real,

- (b) find the value of a . **(1)**

Using this value for a ,

- (c) find the values of the modulus and argument of z , giving the argument in radians, and giving your answers to 3 significant figures. **(3)**

- (d) Show the points P , Q and R , representing the complex numbers z , z^2 and $z^2 + 2z$ respectively, on a single Argand diagram with origin O . **(3)**

- (e) Describe fully the geometrical relationship between the line segments OP and QR . **(2)**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



Question 7 continued

Lined writing area for question 7 continued

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



