Centre No.					Pape	r Refer	ence			Surname	Initial(s)
Candidate No.			7	3	6	2	/	0	2	Signature	

Paper Reference(s)

7362/02

London Examinations GCE

Pure Mathematics

Alternative Ordinary Level Paper 2

Thursday 15 May 2008 - Morning

Time: 2 hours

Materials required for examination	Items included with question papers
Nil	Nil

Candidates are expected to have an electronic calculator when answering this paper.

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

You must write your answer for each question in the space following the question.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

Full marks may be obtained for answers to ALL questions.

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 11 questions in this question paper. The total mark for this paper is 100.

There are 28 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

Write your answers neatly and legibly.

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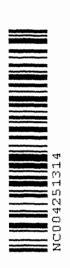
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oining the points $(5, 9)$ and $(11, -3)$.	(5)





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Question 5 continued	
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	Q5
(Total 6 marks)	

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$\frac{2}{x+1}$, $x \neq -1$.

- (a) Find an equation of the asymptote to the curve which is parallel to
 - (i) the x-axis,
- (ii) the y-axis.

(2)

- (b) Find the coordinates of the point where the curve crosses
 - (i) the x-axis,
- (ii) the y-axis.

(2)

(c) Sketch the curve, showing clearly the asymptotes and the coordinates of the points where the curve crosses the coordinate axes.

(3)

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Question 6 continued	Oldlik
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(Total 7 marks)



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$$f(x) = x^2 + kx - 5, k \in \mathbb{R}.$$

The roots of the equation f(x) = 0 are α and β .

(a) Find, in terms of k where appropriate, the value of

(i)
$$\alpha^2 + \beta^2$$
,

(ii)
$$\alpha^2 \beta^2$$
.

(4)

Given that $5(\alpha^2 + \beta^2) = 7\alpha^2 \beta^2$,

(b) find the possible values of k.

(2)

Using the positive value of k found in part (b), and without solving the equation f(x) = 0,

(c) form a quadratic equation, with integer coefficients, which has roots $\frac{1}{\alpha^2}$ and $\frac{1}{\beta^2}$.

(5)

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Question 7 continued	
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- **8.** Solve, to 3 significant figures, for $0 \le \theta \le \pi$,
 - (a) $(4 \sin \theta 1)(2 \sin \theta + 5) = 0$,

(3)

(b) $\tan(2\theta - \frac{1}{3}\pi) = 2.4$,

(4)

(c) $9\sin^2 \theta - 9\cos \theta = 11$.

(5)

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Question 8 continued	
	Q8
(Total 12 marks)	

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9.	The third and fifth terms of an arithmetic series are given by $\log pq^4$ and $\log pq$ respectively, $q \neq 1$.	! ⁸
	The common difference of the series is $b \log q$, where b is a constant. Find	
	(a) the value of b ,)
	(b) the first term of the series.)
	The sum of the first n terms of the series can be written in the form $s \log pq^{r}$.	
	(c) Express r and s in terms of n .)
	Given that the sum of the first 16 terms of the series is 10 times the sum of the first 4 term of the series,	.ș
	(d) show that $\log p = 5 \log q$.)
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- 10. (a) Expand $(1+\frac{1}{2}x)^{\frac{1}{5}}$ in ascending powers of x up to and including the term in x^2 , simplifying each term.
 - (3)
 - (b) Expand $(1-\frac{1}{2}x)^{-\frac{1}{5}}$ in ascending powers of x up to and including the term in x^2 , simplifying each term.
 - **(3)**
 - (c) State the range of values of x for which both expansions are valid.
- (1)
- (d) Expand $\left(\frac{2+x}{2-x}\right)^{\frac{1}{5}}$ in ascending powers of x up to and including the term in x^2 , simplifying each term.
 - (3)

(e) Hence obtain an estimate, to 4 significant figures, of

$$\int_0^{0.5} \left(\frac{2+x}{2-x} \right)^{\frac{1}{5}} dx.$$

- (4)

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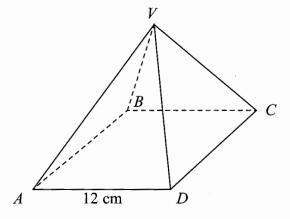


Figure 1

Figure 1 shows a right pyramid with vertex V and square base ABCD, of side 12 cm. The size of angle AVC is 90° .

(a) Show that the height of the pyramid is $6\sqrt{2}$ cm.

(4)

(b) Find, in cm, the length of VA.

(3)

(c) Find, in cm, the exact length of the perpendicular from D to VA. Give your answer in the form $p\sqrt{q}$, where p and q are integers and q is prime.

(3)

Find, in degrees to 1 decimal place, the size of

(d) the angle between the plane VAB and the base ABCD,

(3)

(e) the angle between the plane VAB and the plane VAD.

(4)

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