

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel  
Level 3 GCE**

Centre Number

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Candidate Number

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Time 2 hours

Paper  
reference

**8MA0/01**

**Mathematics**  
**Advanced Subsidiary**  
**PAPER 1: Pure Mathematics**

**You must have:**

Mathematical Formulae and Statistical Tables (Green), calculator

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).
- **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.
- Inexact answers should be given to three significant figures unless otherwise stated.

### Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 16 questions in this question paper. 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.
- Try to answer every question.
- Check your answers if you have time at the end.
- Good luck with your examination.

Turn over ►

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Pearson

1. In this question you should show all stages of your working.

Solutions relying on calculator technology are not acceptable.

Using algebra, solve the inequality

$$x^2 - x > 20$$

writing your answer in set notation.

(3)





































9. Find the value of the constant  $k$ ,  $0 < k < 9$ , such that

$$\int_k^9 \frac{6}{\sqrt{x}} dx = 20$$

(4)

DO NOT WRITE IN THIS AREA

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12. In this question you should show all stages of your working.

Solutions relying entirely on calculator technology are not acceptable.

(i) Solve, for  $0 < \theta \leq 450^\circ$ , the equation

$$5 \cos^2 \theta = 6 \sin \theta$$

giving your answers to one decimal place.

(5)

(ii) (a) A student's attempt to solve the question

“Solve, for  $-90^\circ < x < 90^\circ$ , the equation  $3 \tan x - 5 \sin x = 0$ ”

is set out below.

$$\begin{aligned} 3 \tan x - 5 \sin x &= 0 \\ 3 \frac{\sin x}{\cos x} - 5 \sin x &= 0 \\ 3 \sin x - 5 \sin x \cos x &= 0 \\ 3 - 5 \cos x &= 0 \\ \cos x &= \frac{3}{5} \\ x &= 53.1^\circ \end{aligned}$$

Identify two errors or omissions made by this student, giving a brief explanation of each.

(2)

The first four positive solutions, in order of size, of the equation

$$\cos(5\alpha + 40^\circ) = \frac{3}{5}$$

are  $\alpha_1, \alpha_2, \alpha_3$  and  $\alpha_4$

(b) Find, to the nearest degree, the value of  $\alpha_4$

(2)

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14. A curve  $C$  has equation  $y = f(x)$  where

$$f(x) = -3x^2 + 12x + 8$$

(a) Write  $f(x)$  in the form

$$a(x + b)^2 + c$$

where  $a$ ,  $b$  and  $c$  are constants to be found.

(3)

The curve  $C$  has a maximum turning point at  $M$ .

(b) Find the coordinates of  $M$ .

(2)

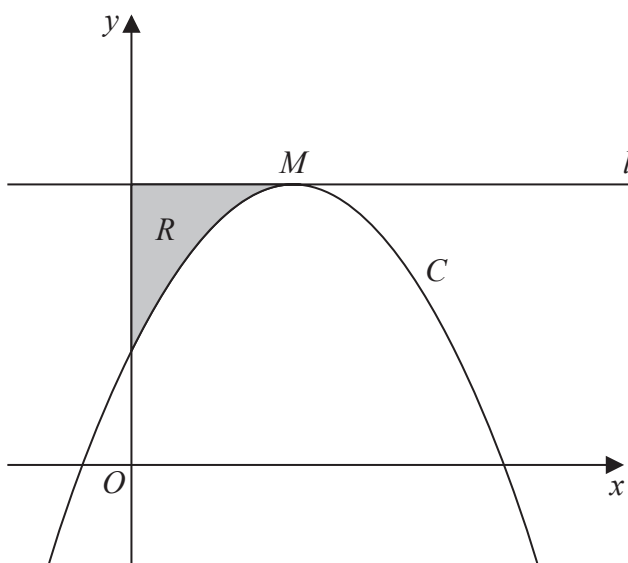


Figure 3

Figure 3 shows a sketch of the curve  $C$ .

The line  $l$  passes through  $M$  and is parallel to the  $x$ -axis.

The region  $R$ , shown shaded in Figure 3, is bounded by  $C$ ,  $l$  and the  $y$ -axis.

(c) Using algebraic integration, find the area of  $R$ .

(5)

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