

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel**  
**International**  
**Advanced Level**

Centre Number

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Candidate Number

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Sample Assessment Materials for first teaching September 2018

(Time: 1 hour 30 minutes)

Paper Reference **WMA12/01**

**Mathematics**

**International Advanced Subsidiary/Advanced Level**  
**Pure Mathematics P2**

**You must have:**

Mathematical Formulae and Statistical Tables, calculator

Total Marks

**Candidates may use any calculator permitted by Pearson regulations. 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 9 questions in this question paper. 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.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ►

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**1.**

(5)

**Question 1 continued**

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Q1

**(Total for Question 1 is 7 marks)**

- (c) Find the smallest value of  $N$ , for which  $S_\infty - S_N < 0.5$

**Question 2 continued**

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### Question 2 continued

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**Question 2 continued**

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**(Total for Question 2 is 8 marks)**

**Q2**

$$y = \sqrt{(3^x + x)}$$

$x$	0	0.25	0.5	0.75	1
$y$	1	1.251			2

- $$\int_0^1 \sqrt{(3^x + x)} \, dx$$

- $$\int_0^1 \sqrt{(3^x + x)} \, dx$$

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### Question 3 continued

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### Question 3 continued

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Q3

**(Total for Question 3 is 7 marks)**

4. Given  $n \in \mathbb{N}$ , prove, by exhaustion, that  $n^2 + 2$  is not divisible by 4.

(4)

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## Q4

**(Total for Question 4 is 4 marks)**

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- (a) Prove that the sum of the first  $n$  terms of the series is

A company, which is making 200 mobile phones each week, plans to increase its production.

The number of mobile phones produced is to be increased by 20 each week from 200 in week 1 to 220 in week 2, to 240 in week 3 and so on, until it is producing 600 in week  $N$ .

- (b) Find the value of  $N$  (2)

The company then plans to continue to make 600 mobile phones each week.

- (c) Find the total number of mobile phones that will be made in the first 52 weeks starting from and including week 1. (5)

## This image shows a full page of blank, lined paper. It features approximately 20 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.

### Question 5 continued

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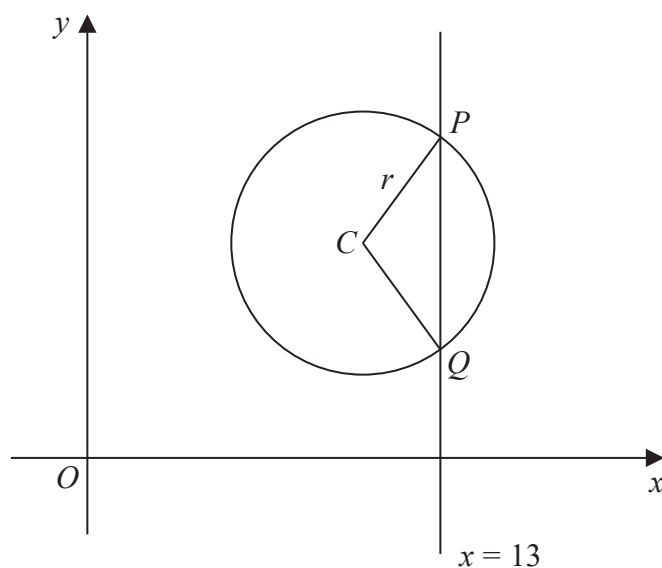


**Q6**

**(Total for Question 6 is 7 marks)**

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**Figure 1**

The circle with equation

$$x^2 + y^2 - 20x - 16y + 139 = 0$$

had centre  $C$  and radius  $r$ .

(a) Find the coordinates of  $C$ .

(2)

(b) Show that  $r = 5$

(2)

The line with equation  $x = 13$  crosses the circle at the points  $P$  and  $Q$  as shown in Figure 1.

(c) Find the  $y$  coordinate of  $P$  and the  $y$  coordinate of  $Q$ .

(3)

A tangent to the circle from  $O$  touches the circle at point  $X$ .

(d) Find, in surd form, the length  $OX$ .

(3)

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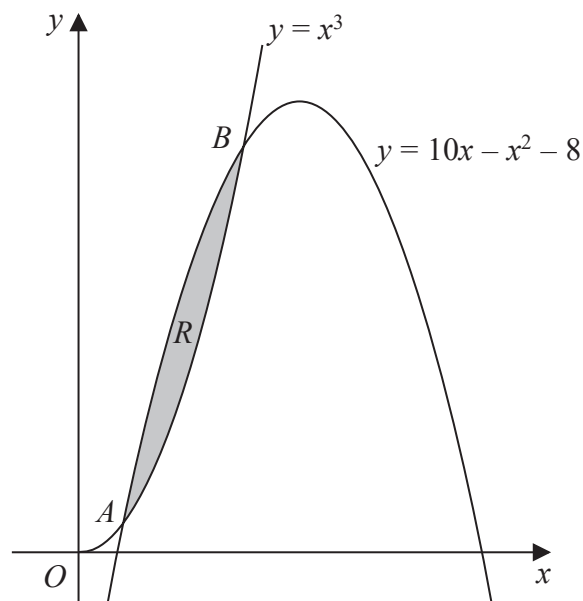
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8.



**Figure 2**

Figure 2 shows a sketch of part of the curves  $C_1$  and  $C_2$  with equations

$$C_1: y = 10x - x^2 - 8 \quad x > 0$$

$$C_2: y = x^3 \quad x > 0$$

The curves  $C_1$  and  $C_2$  intersect at the points  $A$  and  $B$ .

(a) Verify that the point  $A$  has coordinates  $(1, 1)$  (1)

(b) Use algebra to find the coordinates of the point  $B$  (6)

The finite region  $R$  is bounded by  $C_1$  and  $C_2$

(c) Use calculus to find the exact area of  $R$  (5)

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### Question 8 continued

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**Question 9 continued**

**Question 9 continued**

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**TOTAL FOR PAPER IS 75 MARKS**