

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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## Pearson Edexcel International Advanced Level

Time 1 hour 30 minutes

Paper

reference

**WMA11/01**

### Mathematics

**International Advanced Subsidiary/Advanced Level  
Pure Mathematics P1**

**You must have:**

Mathematical Formulae and Statistical Tables (Yellow), 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 10 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.

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1. Find

$$\int 12x^3 + \frac{1}{6\sqrt{x}} - \frac{3}{2x^4} dx$$

giving each term in simplest form.

(5)

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6. **In this question you must show all stages of your working.**

**Solutions relying on calculator technology are not acceptable.**

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

$$f(x) = 2(x + 1)(x - 3)^2$$

(a) Sketch a graph of  $C$ .

Show on your graph the coordinates of the points where  $C$  cuts or meets the coordinate axes.

(3)

(b) Write  $f(x)$  in the form  $ax^3 + bx^2 + cx + d$ , where  $a$ ,  $b$ ,  $c$  and  $d$  are constants to be found.

(3)

(c) Hence, find the equation of the tangent to  $C$  at the point where  $x = \frac{1}{3}$

(4)

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9. In this question you must show all stages of your working.  
Solutions relying on calculator technology are not acceptable.

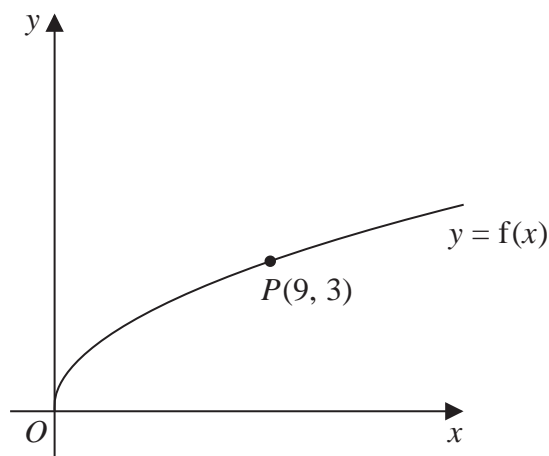


Figure 5

Figure 5 shows a sketch of the curve with equation  $y = f(x)$  where

$$f(x) = \sqrt{x} \quad x > 0$$

The point  $P(9, 3)$  lies on the curve and is shown in Figure 5.

On the next page there is a copy of Figure 5 called Diagram 1.

- (a) On Diagram 1, sketch and clearly label the graphs of

$$y = f(2x) \quad \text{and} \quad y = f(x) + 3$$

Show on each graph the coordinates of the point to which  $P$  is transformed.

(3)

The graph of  $y = f(2x)$  meets the graph of  $y = f(x) + 3$  at the point  $Q$ .

- (b) Show that the  $x$  coordinate of  $Q$  is the solution of

$$\sqrt{x} = 3(\sqrt{2} + 1)$$

(3)

- (c) Hence find, in simplest form, the coordinates of  $Q$ .

(3)

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### Question 9 continued

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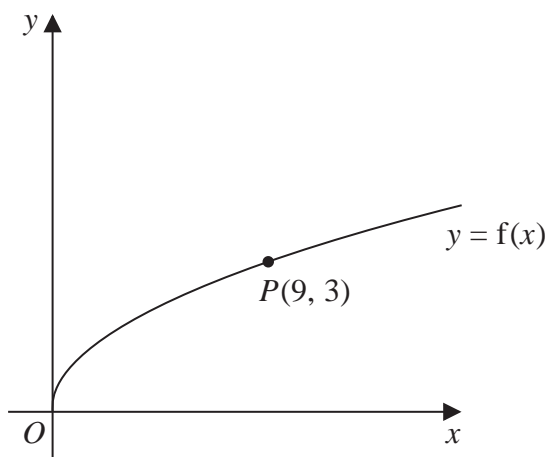
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Only use this copy if you need to redraw your graphs.



Copy of Diagram 1

(Total 9 marks)

09



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**Question 10 continued**

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**Q10**

**(Total 7 marks)**

**TOTAL FOR PAPER IS 75 MARKS**

**END**

