

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 **WMA11/01**

# Mathematics

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

**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 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.
- 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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Answer ALL questions. Write your answers in the spaces provided.

1. Given that  $y = 4x^3 - \frac{5}{x^2}$ ,  $x \neq 0$ , find in their simplest form

(a)  $\frac{dy}{dx}$ ,

(3)

(b)  $\int y \, dx$

(3)

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**Question 1 continued**

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Q1

**(Total for Question 1 is 6 marks)**

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2. (a) Given that  $3^{-1.5} = a\sqrt{3}$  find the exact value of  $a$  (2)

(b) Simplify fully  $\frac{(2x^2)^3}{4x^2}$  (3)

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**Question 2 continued**

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**(Total for Question 2 is 5 marks)**

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3. Solve the simultaneous equations

$$y + 4x + 1 = 0$$

$$y^2 + 5x^2 + 2x = 0$$

(6)

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Question 3 continued

Handwriting practice area consisting of 30 horizontal lines for the answer to Question 3.

Q3

(Total for Question 3 is 6 marks)

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- 4. The straight line with equation  $y = 4x + c$ , where  $c$  is a constant, is a tangent to the curve with equation  $y = 2x^2 + 8x + 3$

Calculate the value of  $c$

(5)

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5. (a) On the same axes, sketch the graphs of  $y = x + 2$  and  $y = x^2 - x - 6$  showing the coordinates of all points at which each graph crosses the coordinate axes. (4)

- (b) On your sketch, show, by shading, the region  $R$  defined by the inequalities

$$y < x + 2 \quad \text{and} \quad y > x^2 - x - 6 \quad (1)$$

- (c) Hence, or otherwise, find the set of values of  $x$  for which  $x^2 - 2x - 8 < 0$  (3)

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6.

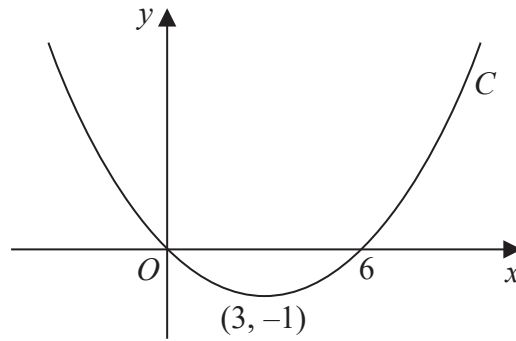
**Figure 1**

Figure 1 shows a sketch of the curve  $C$  with equation  $y = f(x)$

The curve  $C$  passes through the origin and through  $(6, 0)$

The curve  $C$  has a minimum at the point  $(3, -1)$

On separate diagrams, sketch the curve with equation

(a)  $y = f(2x)$  **(3)**

(b)  $y = f(x + p)$ , where  $p$  is a constant and  $0 < p < 3$  **(4)**

On each diagram show the coordinates of any points where the curve intersects the  $x$ -axis and of any minimum or maximum points.

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**Question 6 continued**

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Q6

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

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7. A curve with equation  $y = f(x)$  passes through the point (4, 25)

Given that

$$f'(x) = \frac{3}{8}x^2 - 10x^{-\frac{1}{2}} + 1, \quad x > 0$$

find  $f(x)$ , simplifying each term.

(5)

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**Question 7 continued**

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Q7

(Total for Question 7 is 5 marks)

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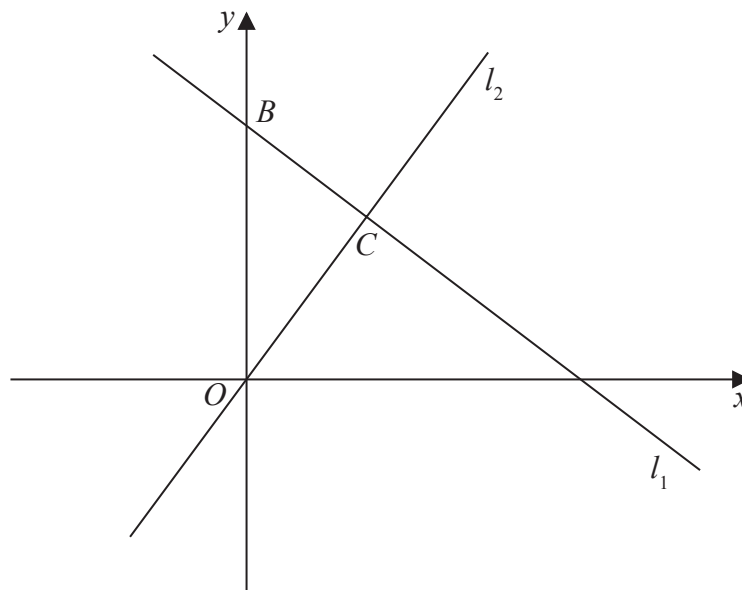


Figure 2

The line  $l_1$ , shown in Figure 2 has equation  $2x + 3y = 26$

The line  $l_2$  passes through the origin  $O$  and is perpendicular to  $l_1$

- (a) Find an equation for the line  $l_2$  (4)

The line  $l_2$  intersects the line  $l_1$  at the point  $C$ . Line  $l_1$  crosses the  $y$ -axis at the point  $B$  as shown in Figure 2.

- (b) Find the area of triangle  $OBC$ . Give your answer in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers to be found. (6)

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Question 8 continued

Lined writing area for the answer to Question 8.

(Total for Question 8 is 10 marks)

Q8

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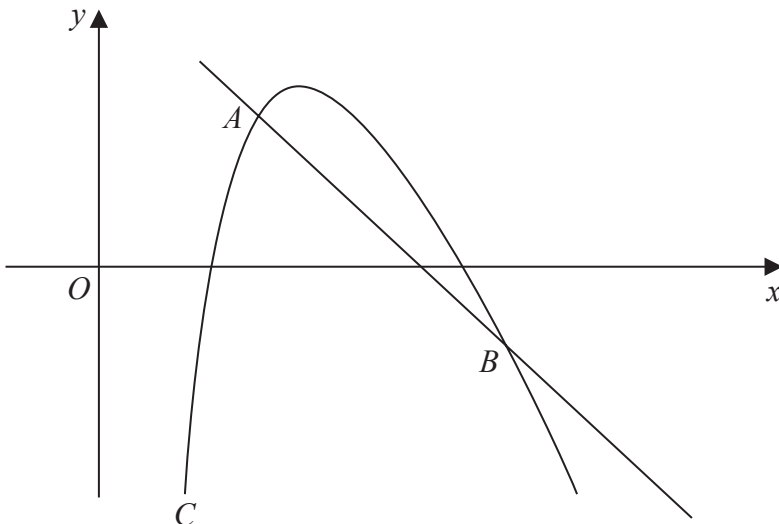


Figure 3

A sketch of part of the curve  $C$  with equation

$$y = 20 - 4x - \frac{18}{x}, \quad x > 0$$

is shown in Figure 3.

Point  $A$  lies on  $C$  and has  $x$  coordinate equal to 2

- (a) Show that the equation of the normal to  $C$  at  $A$  is  $y = -2x + 7$ . (6)

The normal to  $C$  at  $A$  meets  $C$  again at the point  $B$ , as shown in Figure 3.

- (b) Use algebra to find the coordinates of  $B$ . (5)

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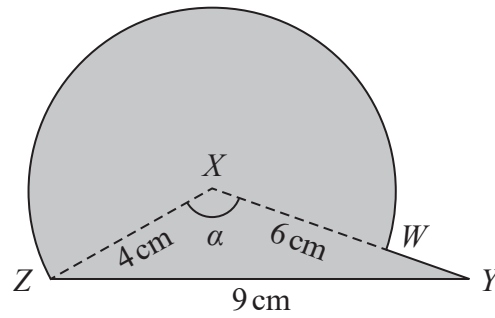


Figure 4

The triangle  $XYZ$  in Figure 4 has  $XY = 6$  cm,  $YZ = 9$  cm,  $ZX = 4$  cm and angle  $ZXY = \alpha$ .

The point  $W$  lies on the line  $XY$ .

The circular arc  $ZW$ , in Figure 4, is a major arc of the circle with centre  $X$  and radius 4 cm.

(a) Show that, to 3 significant figures,  $\alpha = 2.22$  radians. (2)

(b) Find the area, in  $\text{cm}^2$ , of the major sector  $XZWX$ . (3)

The region, shown shaded in Figure 4, is to be used as a design for a logo.

Calculate

(c) the area of the logo (3)

(d) the perimeter of the logo. (4)

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