Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Thursday 11 June 2026

Time: 2 Hours

Paper reference **MWD/02**

Mathematics

Advanced

PREDICTED PAPER 2: Pure Mathematics 2

You must have:
Mathematical Formulae and Statistical Tables (Green), calculator

Total Marks

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.

Scan here:

Hello there! I hope your revision is going splendidly.

Welcome to my Predicted Paper 2 for Edexcel A Level Maths June 2026!

My name is Daniel, I am a full time GCSE and A Level Maths tutor with a First-Class degree In BSc Mathematics.

In addition to my tutoring sessions, I run a YouTube channel where I offer detailed walkthroughs of past GCSE and A-Level Maths papers. I am also on TikTok and Instagram, where I go through quick-fire questions to help students stay sharp, whether they're scrolling late at night or on their way to school!

This paper includes a variety of questions gathered from past exam papers (all publicly available) and questions created by me! I've uploaded a full video walkthrough for this paper on my YouTube channel – it's a great way to check your answers and understand the methods. You can access it by scanning the QR code below or in the top right corner of each page! Do the paper FIRST before watching the video!

DISCLAIMER:

There is no guarantee the topics in this paper will come up. Use this paper as extra practice alongside comprehensive revision. Good luck!!!

SCAN THE QR CODE FOR THE ENTIRE WALKTHROUGH

1. Given that θ is small and in radians, use the small angle approximations to find an approximate value of

$$\frac{1-\cos 6\theta}{3\theta \sin 2\theta}$$

(3)

Question 1 continued

(Total for Question 1 is 3 marks)

2. The sequence u_1 , u_2 , u_3 , … is defined by

$$u_{n+1} = pu_n + q$$

where p and q are constants.

Given that $u_1 = 5$

(a) write down u_2 in terms of p and q.

(1)

Given also that

- $u_2 = 12$
- $\sum_{r=1}^{3} u_r = 50$

(b) find the value of p and the value of q.

(3)

Question 2 continued

(Total for Question 2 is 4 marks)

3. Relative to a fixed origin, points *A, B* and *C* have position vectors **a**, **b** and **c** respectively.

Given that

- *A, B* and *C* lie on a straight line
- *B* lies one quarter of the way from *A* to *C*

show that

$$\mathbf{b} = \frac{1}{4}(\mathbf{c} + 3\mathbf{a})$$

(3)

Question 3 continued

(Total for Question 3 is 3 marks)

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

In an arithmetic series,

- the sixth term is 2
- the sum of the first ten terms is –80

For this series,

(a) find the value of the first term and the value of the common difference.

(4)

(b) Hence find the smallest value of n for which

$$S_n > 8000$$

(3)

Question 4 continued

(Total for Question 4 is 7 marks)

5. A curve has equation

$$y = 3x^2 - 4x$$

The curve passes through the point $P(2, 4)$

Use differentiation from principles to find the value of the gradient of the curve at P.

(5)

(Total for Question 5 is 5 marks)

Question 5 continued

(Total for Question 5 is 5 marks)

6. The distance, d metres, travelled by a robot t seconds after it starts moving is modelled by the equation

$$d^2 = at + b \qquad 0 \leq t < 30$$

where a and b are constants.

Given that

- the robot had travelled 3 m, exactly 2 seconds after it started moving
- the robot had travelled 5 m, exactly 8 seconds after it started moving

(a) find a complete equation for the model, giving the values of a and b to 3 significant figures. **(4)**

Given that the robot had travelled 7 m, exactly 18 seconds after it started moving

(b) evaluate the model, giving reasons for your answer **(2)**

Question 6 continued

(Total for Question 6 is 6 marks)

7. The circle C_1 has equation

$$x^2 + y^2 + 8x - 10y = 29$$

(a) (i) Find the coordinates of the centre of C_1

(ii) Find the exact value of the radius of C_1

(3)

In part (b) you must show detailed reasoning.

The circle C_2 has equation

$$(x - 5)^2 + (y + 8)^2 = 52$$

(b) Prove that the circles C_1 and C_2 neither touch nor intersect.

(3)

Question 7 continued

Question 7 continued

Question 7 continued

(Total for Question 7 is 6 marks)

8. (a) Find the first 4 terms of the binomial expansion, in ascending powers of x, of

$$(8 - 3x)^{-\frac{1}{3}} \qquad |x| < \frac{8}{3}$$

giving each coefficient as a simplified fraction.

(4)

(b) Use the answer from part (a) with $x = \frac{2}{3}$ to find a rational approximation to $\sqrt[3]{6}$

(2)

Question 8 continued

(Total for Question 8 is 6 marks)

9. (a) Sketch the curve with equation

$$y = a^x + 4$$

where a is a positive constant greater than 1

On your sketch, show

- the coordinates of the point of intersection of the curve with the y-axis
- the equation of the asymptote of the curve

(3)

x	2	2.3	2.6	2.9	3.2	3.5
y	0	0.3246	0.8629	1.6643	2.7896	4.3137

The table shows corresponding values of x and y for

$$y = 2^x - 2x$$

with the values of y given to 4 decimal places as appropriate.

Using the trapezium rule with all the values of y in the given table,

(b) obtain an estimate for $\int_2^{3.5} (2^x - 2x)\, dx$, giving your answer to 2 decimal places.

(3)

(c) Using your answer to part (b) and making your method clear, estimate

(i) $\int_2^{3.5} (2^x + 2x)\, dx$

(ii) $\int_2^{3.5} (2^{x+1} - 4x)\, dx$

(3)

Question 9 continued

Question 9 continued

Question 9 continued

(Total for Question 9 is 9 marks)

10. Given that

$$3\log_2(t+4) - 2\log_2(t-2) = 7$$

(a) verify that $t = 4$ is a solution of the above equation,

(2)

(b) show that

$$t^3 - 116t^2 + 560t - 448 = 0$$

(3)

(c) Hence, using algebra and showing your working, solve

$$3\log_2(t+4) - 2\log_2(t-2) = 7$$

giving each answer in simplest form.

(Solutions based entirely on calculator technology are not acceptable.)

(4)

Question 10 continued

Question 10 continued

Question 10 continued

(Total for Question 10 is 9 marks)

11. A scientist monitored the growth of bacteria on a dish over a 30-day period.

The area, $N\,\text{mm}^2$, of the dish covered by bacteria, t days after monitoring began, is modelled by the equation

$$\log_{10} N = 0.0646\,t + 1.478 \qquad 0 \leq t \leq 30$$

(a) Show that this equation may be written in the form

$$N = ab^t$$

where a and b are constants to be found. Give the value of a to the nearest integer and give the value of b to 3 significant figures.

(4)

(b) Use the model to find the area of the dish covered by bacteria 30 days after monitoring began. Give your answer, in mm^2, to 2 significant figures.

(2)

Question 11 continued

(Total for Question 11 is 6 marks)

12. Given that

$$\frac{4x^3 + 2x^2 + 3x + 8}{x^2 + 4} \equiv Ax + B + \frac{Cx + D}{x^2 + 4}$$

(a) (i) find the values of the constants A, B and C

(ii) show that $D = 0$

(4)

(b) Hence, using algebraic integration, find

$$\int_1^4 \frac{4x^3 + 2x^2 + 3x + 8}{x^2 + 4}\, dx$$

giving your answer in the form $p + q \ln 2$, where p and q are integers.

(5)

Question 12 continued

Question 12 continued

Question 12 continued

(Total for Question 12 is 9 marks)

13. Use the substitution $u = \sqrt{x^3 + 1}$ to show that

$$\int \frac{9x^5}{\sqrt{x^3+1}} dx = 2(x^3+1)^k(x^3 - A) + c$$

where k and A are constants to be found and c is an arbitrary constant.

(5)

Question 13 continued

(Total for Question 13 is 5 marks)

14.

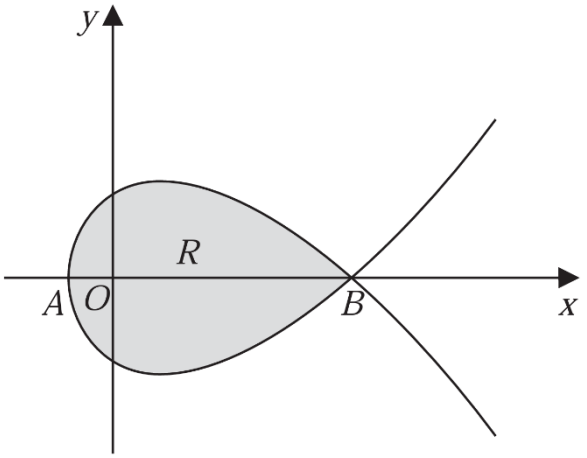

Figure 3 shows a sketch of part of the curve C with parametric equations

$$x = 7t^2 - 5, \qquad y = t(9 - t^2), \qquad t \in \mathbb{R}$$

(a) Find an equation of the tangent to C at the point where $t = 1$

Write your answer in the form $ax + by + c = 0$, where a, b and c are integers.

(5)

The curve C cuts the x-axis at the points A and B, as shown in Figure 3

(b) (i) Find the x coordinate of the point A.

(ii) Find the x coordinate of the point B.

(3)

The region R, shown shaded in Figure 3, is enclosed by the loop of the curve C.

(c) Use integration to find the area of R.

(5)

Question 14 continued

Question 14 continued

Question 14 continued

(Total for Question 14 is 13 marks)

15. Given that

$$x^2 + 2xy - y^2 = 12$$

(a) Show that

$$\frac{dy}{dx} = -\frac{x+y}{x-y}$$

(4)

(b) Hence, show that

$$\frac{d^2y}{dx^2} = \frac{24}{(x-y)^3}$$

(6)

Question 15 continued

Question 15 continued

Question 15 continued

Question 15 continued

(Total for Question 15 is 10 marks)

TOTAL FOR PAPER IS 100 MARKS

***Scan here*:**

Congratulations on completing the paper! I hope it has helped you with your revision.

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Take care!