

Cambridge International Examinations

Cambridge International Advanced Subsidiary Level

| Additional Mater | rials: | List of Formulae (MF9 | 9) | | | | |
|---------------------------------|-----------|-----------------------|----|---------------------|----------|---------|------|
| Candidates answ | wer on th | e Question Paper. | | | | | |
| | | | | | 1 hour | 15 minu | ites |
| Paper 2 Pure Mathematics 2 (P2) | | | | Mag | y/June 2 | 018 | |
| MATHEMATICS | 3 | | | | | 9709 | /22 |
| CENTRE NUMBER | | | | CANDIDATE NUMBER | | | |
| NAME | | | | | | | |

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** the questions in the space provided. If additional space is required, you should use the lined page at the end of this booklet. The question number(s) must be clearly shown.

Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.

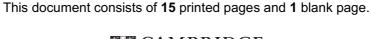
The use of an electronic calculator is expected, where appropriate.

You are reminded of the need for clear presentation in your answers.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 50.





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| Determine w | whether the sta | tionary point | is a maximu | m or minimur | n point. | |
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| 3 (1) Tilld the quotient whe | 3 (i | nd the quotient v | <i>w</i> hen |
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| $x^4 - 2x^3 + 8x^2 - 12x + 13$ | |
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| is divided by $x^2 + 6$ and show that the remainder is 1. | [3] |
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| (ii) | Show that the equation $x^4 - 2x^3 + 8x^2 - 12x + 12 = 0$ | |
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| | has no real roots. | [3] |
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| (ii) | Hence | solve | the | equation |
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| $2\ln(2^{u+1}) - \ln(2^u + 3) = 4\ln 2,$ | | | | | |
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| giving the value of u correct to 4 significant figures. | [2] | | | | |
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| 5 A curve has equation |
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| v^3 s | in 2x | +4y | = 8. |
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| Find the equation of the tangent to the curve at the point where it crosses the <i>y</i> -axis. | [6] |
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It is given that $\int_0^a (1 + e^{\frac{1}{2}x})^2 dx = 10$, where *a* is a positive constant.

| Show that $a = 2 \ln \left(\frac{15 - a}{4 + e^{\frac{1}{2}a}} \right)$. | |
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| Use an iterative | formula based of | on the equation | in part (i) to fin | nd the value o | of a corre |
| Use an iterative | formula based oures. Give the resu | on the equation ult of each iterat | in part (i) to find to 5 significant | nd the value of the figures. | of <i>a</i> corre |
| Use an iterative 3 significant figu | formula based oures. Give the resu | on the equation ult of each iterat | in part (i) to fin to 5 significan | nd the value o | of a corre |
| Use an iterative 3 significant figu | formula based oures. Give the resu | on the equation ult of each iterat | in part (i) to fin ion to 5 significan | nd the value on the figures. | of <i>a</i> corre |
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| | Show that $2\csc^2 2x(1-\cos 2x) \equiv \sec^2 x$. | |
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| (ii) | Solve the equation $2\csc^2 2x(1-\cos 2x) = \tan x + 21$ for $0 < x < \pi$, giving you to 3 significant figures. | r answers co |
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| | Find $\int [2 \csc^2(4y + 2) - 2 \csc^2(4y + 2) \cos(4y + 2)] dy$ | [3] |
| (iii) | Find $\int [2\csc^2(4y+2) - 2\csc^2(4y+2)\cos(4y+2)] dy$. | [3] |
| iii) | Find $\int [2\csc^2(4y+2) - 2\csc^2(4y+2)\cos(4y+2)] dy$. | [3] |
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| iii) | Find $\int [2\csc^2(4y+2) - 2\csc^2(4y+2)\cos(4y+2)] dy$. | [3] |
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| (iii) | Find $\int [2\csc^2(4y+2) - 2\csc^2(4y+2)\cos(4y+2)] dy$. | [3] |
| (iii) | Find $\int [2\csc^2(4y+2) - 2\csc^2(4y+2)\cos(4y+2)] dy$. | [3] |

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Additional Page

| If you use the following lined page to complete the answer(s) to any question(s), the question number(s must be clearly shown. |
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