EXAM PAPER

Mathematical Methods Unit 3 & 4 — Examination 1 (Practice 2)

PREVIEW
This file has the first 5 of the 9 questions in this paper. The rest is locked: it comes with a PrepNest plan, or with the paper itself for VCE.

Reading time: 15 minutes (no writing)
Writing time: 60 minutes
Total time: 75 minutes

SECTIONS IN THIS PAPER

- Examination 1 — technology-free — 60 min (no calculator)

INSTRUCTIONS

You are not permitted to write during reading time — you may only read the paper and plan your approach. Answer every question you can. Write your working in the space provided for long-answer questions. Marking guidance and full explanations are provided in the separate answer key.

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Examination 1 — technology-free

60 minutes • No calculator

Question 1 (4 marks)

This question is about differentiation.

a. Let $y = e^{2x} \sin(x)$. Find dy/dx. 2 marks

b. Let $g(x) = x/(x^2 + 1)$. Evaluate $g'(2)$. 2 marks

Question 2 (3 marks)

This question is about antidifferentiation.

a. Find an antiderivative of $1/(2x + 1)$, where $x > -1/2$. 1 mark

b. Evaluate $\int \cos(2x)\, dx$ from $x = 0$ to $x = \pi/6$. 2 marks

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Question 3

(5 marks)

This question is about circular functions.

a. Solve $2\cos(x) + \sqrt{3} = 0$ for $x \in [0, 2\pi]$. 2 marks

b. Sketch the graph of $y = 3\sin(2x) + 1$ for $x \in [0, \pi]$. Label the endpoints and the turning points with their coordinates. 3 marks

Question 4

(5 marks)

A bag contains 4 red marbles and 6 blue marbles.

a. Two marbles are drawn at random without replacement. Find the probability that both are red. 1 mark

b. Two marbles are drawn at random without replacement. Find the probability that they are different colours. 2 marks

c. Instead, three marbles are drawn one at a time, with each marble replaced before the next draw. Let X be the number of red marbles drawn. Find $\Pr(X = 2)$. 2 marks

Question 5

(4 marks)

Let $f: R \to R$, $f(x) = x^2 - 4x + 5$.

a. Find the equation of the tangent to the graph of $y = f(x)$ at the point where $x = 3$. 2 marks

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b. The tangent meets the x-axis at A and the y-axis at B, and O is the origin. Find the area of triangle OAB. 2 marks

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6.

7.

8.

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9.

4 questions locked, up to question 9.

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PREVIEW

That’s the end of the preview

You’ve seen the first 5 of the 9 questions in Mathematical Methods Unit 3 & 4 — Examination 1 (Practice 2). The full paper is worth 40 marks.

STILL TO COME	QUESTIONS	MARKS
Examination 1 — technology-free	4	19

The full paper comes with

- Every question, printed exactly like the ones in this preview
- The complete answer key, with the working behind every mark
- A topic report after marking, showing what to practice next

Get the full paper at

prepnest.com.au/practice/exams/maths_methods-year_12-2-exam1

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