EXAM PAPER

Mathematical Methods Unit 3 & 4 — Examination 2 (Practice 5)

PREVIEW
This file has the first 12 of the 24 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: 120 minutes
Total time: 135 minutes

SECTIONS IN THIS PAPER

- Section A — multiple choice — 45 min (calculator allowed)
- Section B — extended response — 75 min (calculator allowed)

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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Section A — multiple choice

45 minutes • Calculator allowed

1. The range of the function f: (0, ∞) → R, f(x) = 3 − 2e^{-x} is

A. (1, 3)

B. [1, 3)

C. (−∞, 3)

D. (1, ∞)

E. (3, 5)

2. Which one of the following functions has an inverse function?

A. f: [0, π] → R, f(x) = sin(x)

B. f: [2, 5] → R, f(x) = (x − 2)^2

C. f: R → R, f(x) = x^2 − 4

D. f: [−1, 1] → R, f(x) = x^4

E. f: R → R, f(x) = x^3 − 3x

3. The transformation T: R^2 → R^2, T(x, y) = (3 − x, 2y + 1) maps the graph of y = √x onto the graph of

A. y = 2√(x − 3) + 1

B. y = 2√(x + 3) + 1

C. y = (1/2)√(3 − x) + 1

D. y = 2√(3 − x) − 1

E. y = 2√(3 − x) + 1

4. The solutions of 2cos(x) + √3 = 0 for x ∈ [0, 2π] are

A. x = 5π/6 and x = 7π/6

B. x = π/6 and x = 11π/6

C. x = 2π/3 and x = 4π/3

D. x = π/3 and x = 5π/3

E. x = 7π/6 and x = 11π/6

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5. The graph of $y = a\log_e(x - b)$ passes through the points $(3, 0)$ and $(e + 2, 4)$. The values of a and b are

A. $a = 2$ and $b = 4$

B. $a = 4$ and $b = 2$

C. $a = 4$ and $b = -2$

D. $a = 4$ and $b = 3$

E. $a = e$ and $b = 2$

6. If $3^x = 5$, then 9^{x+1} is equal to

A. 45

B. 50

C. 75

D. 225

E. 250

7. Newton's method is used to find an approximate solution of $e^x - 3 = 0$, with an initial estimate of $x_0 = 1$. The value of x_1 is

A. $1 - 3/e$

B. $e - 3$

C. $1 + 3/e$

D. $\log_e(3)$

E. $3/e$

8. The sum of all real solutions of the equation $\log_e(x^2) = 2\log_e(3)$ is

A. -3

B. 0

C. 3

D. 6

E. 9

9. If $y = (2x + 1)/(x - 1)$, then dy/dx is equal to

A. $-3/(x - 1)^2$

B. $3/(x - 1)^2$

C. $-1/(x - 1)^2$

D. $(4x - 1)/(x - 1)^2$

E. 2

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10. The function f: R → R, $f(x) = x^3 - 3x^2 - 9x + 1$ is strictly decreasing on the interval

A. $(-\infty, -1]$

B. $[-1, 3]$

C. $[3, \infty)$

D. $[-3, 1]$

E. R

11. Given that $\int 2e^{2x}\,dx$ from $x = 0$ to $x = a$ is equal to 8, the value of a is

A. $\log_e(9)$

B. $\log_e(4)$

C. $\log_e(3)$

D. $(1/2)\log_e(8)$

E. 3

12. The function f is differentiable, with $f(2) = 3$ and $f'(2) = -1$. If $g(x) = xf(x)$, then $g'(2)$ is equal to

A. -2

B. -1

C. 1

D. 3

E. 5

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13.

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4.

12 questions locked, up to question 4.

PREVIEW

That’s the end of the preview

You’ve seen the first 12 of the 24 questions in Mathematical Methods Unit 3 & 4 — Examination 2 (Practice 5). The full paper is worth 80 marks.

STILL TO COME	QUESTIONS	MARKS
Section A — multiple choice	8	8
Section B — extended response	4	60

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_12-5-exam2

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