EXAM PAPER

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

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 maximal domain of the function with rule $f(x) = \sqrt{(x - 1)} + \log_e(5 - x)$ is

A. [1, 5)

B. (1, 5)

C. [1, 5]

D. (1, 5]

E. [1, ∞)

2. The range of the function $f: (-1, 2] \to R$, $f(x) = x^2$ is

A. (1, 4]

B. (0, 4]

C. [1, 4]

D. [0, 1)

E. [0, 4]

3. The random variable X is normally distributed with mean μ and standard deviation σ. Given that $Pr(X < 30) = 0.2$ and $Pr(X > 50) = 0.1$, the values of μ and σ, correct to two decimal places, are

A. μ = 36.77 and σ = 8.04

B. μ = 37.93 and σ = 9.42

C. μ = 40.00 and σ = 9.42

D. μ = 42.07 and σ = 9.42

E. μ = 37.93 and σ = 88.73

4. When $P(x) = x^3 + kx^2 - 4x + 3$ is divided by $x - 2$, the remainder is 7. The value of k is

A. −1

B. 1

C. 7/4

D. 2

E. 3

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5. The derivative of $\sin^3(2x)$ with respect to x is

A. $3\sin^2(2x)$

B. $3\sin^2(2x)\cos(2x)$

C. $6\sin^2(2x)$

D. $6\sin^2(2x)\cos(2x)$

E. $-6\sin^2(2x)\cos(2x)$

6. Let $f(x) = \log_e(2x)$. The average rate of change of f over the interval $[1, e]$ is

A. $e - 1$

B. 1

C. $1/e$

D. $\log_e(2)/(e - 1)$

E. $1/(e - 1)$

7. The random variable X has a binomial distribution with mean 6 and variance 4.2. The parameters n and p of the distribution are

A. $n = 20, p = 0.3$

B. $n = 20, p = 0.7$

C. $n = 10, p = 0.6$

D. $n = 15, p = 0.4$

E. $n = 30, p = 0.2$

8. The graph of $y = f(x)$ is transformed by the mapping $(x, y) \to (2x - 1, 3y + 4)$. The rule of the image is

A. $y = 3f(2x - 1) + 4$

B. $y = 3f((x - 1)/2) + 4$

C. $y = (1/3)f((x + 1)/2) - 4$

D. $y = 3f((x + 1)/2) + 4$

E. $y = 3f(2x + 1) + 4$

9. Using the trapezium rule with strips of width 1, an approximation to $\int 2^x\,dx$ from $x = 0$ to $x = 3$ is

A. 7

B. 10.1

C. 10.5

D. 14

E. 21

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10. The continuous random variable X has probability density function f(x) = (1/2)sin(x) for 0 ≤ x ≤ π, and 0 elsewhere. Pr(X < π/3) is

A. 1/4

B. 1/3

C. √3/4

D. 1/2

E. 3/4

11. The number of solutions of the equation $e^x = 2 - x^2$ is

A. 0

B. 1

C. 2

D. 3

E. 4

12. If $\log_a(b) = 3$, where a, b > 0 and a, b ≠ 1, then log_b(a^2) is equal to

A. 1/6

B. 2/3

C. 3/2

D. 6

E. 9

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13.

14.

15.

16.

17.

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18.

19.

20.

1.

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2.

3.

4.

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12 questions locked, up to question 4.

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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 3). 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_12-3-exam2

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