EXAM PAPER

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

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 period of the function with rule $y = -3\tan(2x/3) + 1$ is

A. $2\pi/3$

B. $\pi/3$

C. $3\pi/2$

D. 3π

E. $\pi/2$

2. Let $f(x) = 1/(x - 3) + 2$. The range of f is

A. $R \setminus \{2\}$

B. $R \setminus \{3\}$

C. $(2, \infty)$

D. $R \setminus \{-2\}$

E. R

3. The solution of $2\log_3(x) - \log_3(x + 4) = 1$ is

A. $(3 - \sqrt{57})/2$

B. 4

C. both $(3 - \sqrt{57})/2$ and $(3 + \sqrt{57})/2$

D. there is no real solution

E. $(3 + \sqrt{57})/2$

4. Consider the system of simultaneous linear equations $kx + 4y = 8$ and $3x + (k - 1)y = k$, where k is a real constant. The system has no solution when

A. $k = 4$ only

B. $k \in \{-3, 4\}$

C. $k = -3$ only

D. $k \in R \setminus \{-3, 4\}$

E. no value of k

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5. If $f(x) = x\log_e(x)$, where $x > 0$, then $f'(e^2)$ is equal to

A. 1

B. 2

C. e^2

D. 3

E. $2e^2$

6. The average value of the function $f(x) = 4x - x^2$ over the interval $[0, 3]$ is

A. 3

B. 9

C. 4

D. 27

E. 1

7. The random variable X has a binomial distribution with $n = 10$ and $p = 0.3$. Correct to four decimal places, $Pr(X \geq 2)$ is

A. 0.1493

B. 0.2335

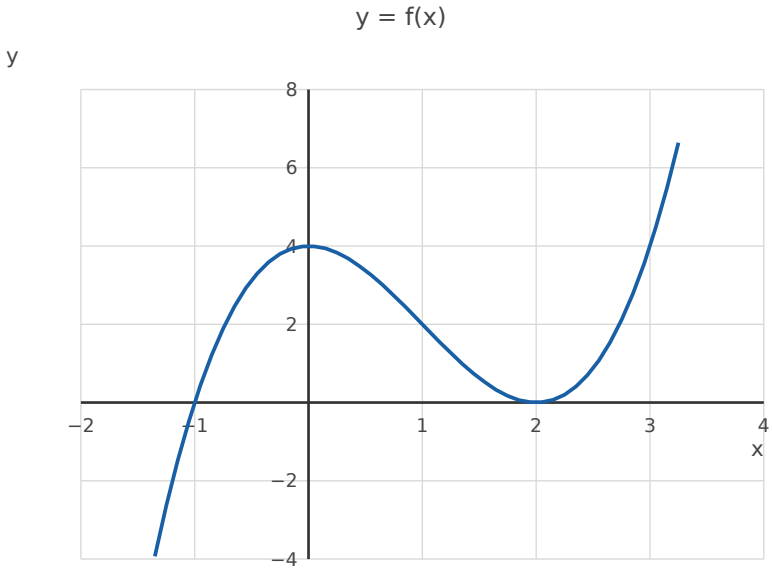
C. 0.3828

D. 0.6172

E. 0.8507

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8. Part of the graph of a cubic function y = f(x) is shown below. A possible rule for f is



A. $y = (x - 1)(x + 2)^2$

B. $y = (x + 1)^2(x - 2)$

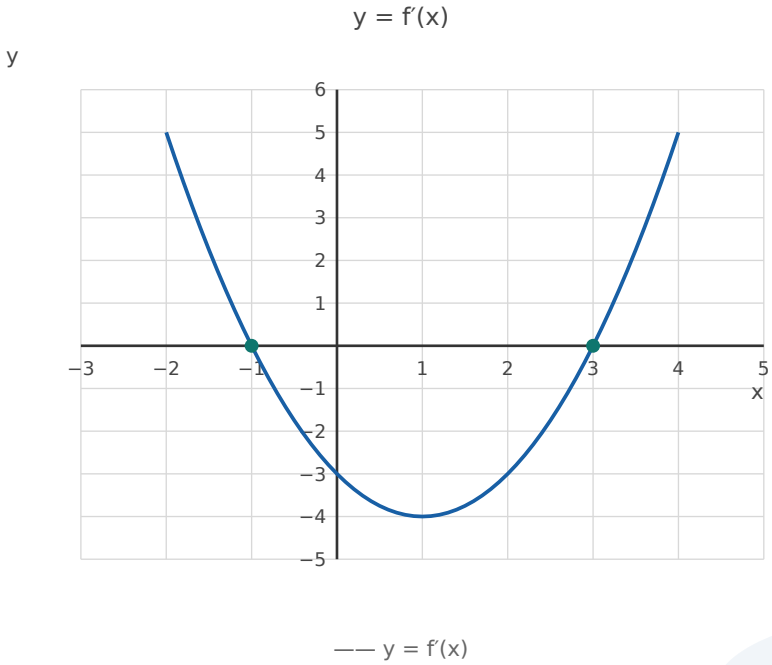
C. $y = (x + 1)(x - 2)^2$

D. $y = -(x + 1)(x - 2)^2$

E. $y = (x + 1)(x + 2)^2$

PrepNest

9. The graph below shows y = f′(x), the derivative of a function f. The graph of y = f(x) has a local maximum at



A. x = −3

B. x = −1

C. x = 1

D. x = 3

E. f has no local maximum

10. The random variable X is normally distributed with a mean of 72 and a standard deviation of 8. Correct to four decimal places, Pr(X > 80 | X > 64) is

A. 0.1587

B. 0.3173

C. 0.6827

D. 0.1886

E. 0.8413

11. A population proportion is p = 0.4. Random samples of size 25 are taken from this population. Correct to three decimal places, the standard deviation of the distribution of the sample proportion is

A. 0.0096

B. 0.049

C. 0.24

D. 0.4

E. 0.098

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12. Let f: [2, ∞) → R, f(x) = (x − 2)² + 3. The rule for the inverse function f^{-1} is

A. $f^{-1}(x) = 2 + \sqrt{(x - 3)}$

B. $f^{-1}(x) = 2 - \sqrt{(x - 3)}$

C. $f^{-1}(x) = \sqrt{(x - 2)} + 3$

D. $f^{-1}(x) = (x - 3)^2 + 2$

E. $f^{-1}(x) = 1/((x - 2)^2 + 3)$

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3.

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 1). 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_12-1-exam2

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