EXAM PAPER

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

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 function f: [a, ∞) → R, $f(x) = x^2 - 6x + 5$ has an inverse function. The smallest possible value of a is

A. −3

B. 0

C. 1

D. 3

E. 5

2. The equation of the vertical asymptote of the graph of $y = \log_e(4 - 2x) + 1$ is

A. x = 4

B. x = −2

C. x = 1

D. y = 1

E. x = 2

3. The graph of y = f(x) is reflected in the x-axis and then translated 2 units in the positive direction of the x-axis. The rule of the image is

A. y = −f(x − 2)

B. y = −f(x + 2)

C. y = f(2 − x)

D. y = −f(x) − 2

E. y = f(−x − 2)

4. The simultaneous linear equations kx + 3y = 6 and 3x + ky = k + 3, where k is a real constant, have infinitely many solutions when

A. k = −3

B. k = 3 or k = −3

C. k = 0

D. k = 9

E. k = 3

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5. If $y = e^{3x}\cos(2x)$, then dy/dx is equal to

A. $e^{3x}(3\cos(2x) - 2\sin(2x))$

B. $e^{3x}(3\cos(2x) + 2\sin(2x))$

C. $-6e^{3x}\sin(2x)$

D. $3e^{3x}\cos(2x)$

E. $e^{3x}(\cos(2x) - 2\sin(2x))$

6. The gradient of the tangent to the graph of $y = \log_e(x^2 + 3)$ at the point where $x = 1$ is

A. 1/4

B. 1/2

C. 1/3

D. 2

E. $\log_e(4)$

7. A function f has derivative $f'(x) = (x - 2)^2(x + 1)$. The graph of $y = f(x)$ has

A. a local maximum at $x = -1$ and a local minimum at $x = 2$

B. a local maximum at $x = -1$ and a stationary point of inflection at $x = 2$

C. a stationary point of inflection at $x = -1$ and a local minimum at $x = 2$

D. a local minimum at $x = 2$ only

E. a local minimum at $x = -1$ and a stationary point of inflection at $x = 2$

8. The total area of the regions enclosed by the graph of $y = \sin(x)$, the x-axis and the lines $x = 0$ and $x = 3\pi/2$ is

A. 0

B. 1

C. 2

D. 3

E. 4

9. The volume of a spherical balloon is increasing at a rate of 20 cm^3 per second. When the radius is 5 cm, the rate at which the radius is increasing, in cm per second, is

A. $1/(5\pi)$

B. $1/(20\pi)$

C. $1/(100\pi)$

D. $4\pi/5$

E. 5π

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10. The random variable X has a binomial distribution with n = 12 and p = 0.25. Pr(X = 3), correct to four decimal places, is

A. 0.0012

B. 0.2323

C. 0.2581

D. 0.6093

E. 0.6488

11. The random variable X is normally distributed with a mean of 50 and a standard deviation of 5. Pr(X < 42), correct to four decimal places, is

A. 0.0228

B. 0.0548

C. 0.1151

D. 0.4452

E. 0.9452

12. The random variable X is normally distributed with a standard deviation of 4. Given that Pr(X > 30) = 0.05, the mean of X, correct to two decimal places, is

A. 22.16

B. 23.42

C. 25.00

D. 26.00

E. 36.58

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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 4). 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_12-4-exam2

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