EXAM PAPER

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

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. In a random sample of 400 households, 88 had solar panels. Using this sample, an approximate 95% confidence interval for the proportion of households with solar panels is

A. (0.200, 0.240)

B. (0.186, 0.254)

C. (0.179, 0.261)

D. (0.167, 0.273)

E. (0.139, 0.301)

2. The period and range of the function f: R → R, f(x) = 4cos(πx/3) − 1 are

A. 3 and [−5, 3]

B. 6 and [−4, 4]

C. 6 and [−3, 5]

D. 2π/3 and [−5, 3]

E. 6 and [−5, 3]

3. The random variable X is normally distributed with mean 50 and variance 16. Let Z be a standard normal random variable. Pr(X > 56) is equal to

A. Pr(Z < 1.5)

B. 1 − Pr(Z < 0.375)

C. Pr(Z < −0.375)

D. 1 − Pr(Z < 6)

E. 1 − Pr(Z < 1.5)

4. The range of the function f: [−3, 3] → R, f(x) = √(9 − x²) + 1 is

A. [0, 3]

B. [−3, 3]

C. [1, 10]

D. [1, 4]

E. [−2, 4]

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5. Newton’s method is used to find an approximate solution of $x^3 - 5 = 0$, with an initial estimate of $x_0 = 2$. The value of x_1 is

A. 1.5

B. 1.625

C. 1.71

D. 1.75

E. 2.25

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

A. $e^2 - 1$

B. $e^2/2$

C. $e - 1$

D. $(e^2 + 1)/2$

E. $(e^2 - 1)/2$

7. The random variable X has a binomial distribution with n = 20 and p = 0.35. The variance of X is

A. 0.2275

B. 2.13

C. 4.55

D. 7

E. 13

8. The graph of $y = \log_e(x)$ is dilated by a factor of 1/2 from the y-axis, then dilated by a factor of 3 from the x-axis, then translated 2 units in the positive direction of the x-axis. The rule of the image is

A. $y = 3\log_e(2x - 2)$

B. $y = 3\log_e(2x - 4)$

C. $y = 3\log_e(x/2 - 2)$

D. $y = 3\log_e(2x + 4)$

E. $y = (1/3)\log_e(2x - 4)$

9. The tangent to the graph of $y = x^2 - 2x$ that is parallel to the line $y = 4x + 1$ has equation

A. $y = 4x - 9$

B. $y = 4x + 1$

C. $y = 4x - 3$

D. $y = 4x - 12$

E. $y = 4x + 9$

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10. The proportion of a population with a particular property is p = 0.3. For random samples of size 50, the standard deviation of the sample proportion $\hat{P}$, correct to four decimal places, is

A. 0.0042

B. 0.0648

C. 0.2100

D. 0.4583

E. 3.2404

11. The number of solutions of the equation $\tan(2x) = 1$ for $x \in [0, 2\pi]$ is

A. 1

B. 2

C. 4

D. 6

E. 8

12. Consider the system of equations $3x + ky = 6$ and $kx + 3y = 2$, where k is a real constant. The system has no solution when

A. $k = 3$ or $k = -3$

B. $k = 3$ only

C. $k = -3$ only

D. $k = 0$

E. there is no such value of k

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13.

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4.

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 2). 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_12-2-exam2

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