Mathematical Methods Unit 1 & 2 — Practice Exam 1 — Answers & Explanations

Answers to the 15 questions in the free preview.

Mathematical Methods

1. C. f'(x) = 6x + 2
Using the power rule: d/dx(3x²) = 6x and d/dx(2x) = 2, giving 6x + 2.

2. A. 0
The derivative of any constant is 0, since a constant does not change as x changes.

3. B. 1/2
Of the four equally likely outcomes (HH, HT, TH, TT), two have exactly one head, giving 2/4 = 1/2.

4. B. 0.12
For independent events, P(A and B) = P(A) × P(B) = 0.3 × 0.4 = 0.12.

5. D. f'(x) = 12x^2 + 2
Using the power rule, d/dx(4x^3) = 12x^2, and d/dx(2x) = 2.

6. B. f'(x) = 10x^1 + 3
Using the power rule, d/dx(5x^2) = 10x^1, and d/dx(3x) = 3.

7. B. f'(x) = 12x^3 + 4
Using the power rule, d/dx(3x^4) = 12x^3, and d/dx(4x) = 4.

8. D. f'(x) = 12x^1 + 5
Using the power rule, d/dx(6x^2) = 12x^1, and d/dx(5x) = 5.

9. A. f'(x) = 10x^4 + 3
Using the power rule, d/dx(2x^5) = 10x^4, and d/dx(3x) = 3.

10. A. 8
f'(x) = 6x + 2. At x = 1: 6 × 1 + 2 = 8.

11. D. 13
f'(x) = 4x − 3. At x = 4: 4 × 4 − 3 = 13.

12. C. −16
f'(x) = 10x + 4. At x = −2: 10 × −2 + 4 = −16.

13. C. The gradient (slope) of the tangent at that point
The derivative gives the instantaneous rate of change, which is the gradient of the tangent line at that point.

14. D. f'(x) = 3x²
Using the power rule: d/dx(x³) = 3x².

15. B. Zero and changing from positive to negative
At a local maximum, the gradient is momentarily zero as the function changes from increasing to decreasing.

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PREVIEW

That’s the end of the preview answers

These are the answers to the 15 preview questions. The full answer key covers all 30 questions in Mathematical Methods Unit 1 & 2 — Practice Exam 1, with the working behind every mark.

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