Midterm #2

MATH 126-102 — Calculus II
Thursday, Oct 22, 2026

Please print your name:

No notes, graphing calculators or other tools are permitted. There are 30 points in total. You need to show work to receive full credit.

Good luck!

Problem 1. (6 points) Evaluate the following integral or show that it diverges: $\int_1^2 x^2 \ln(x)\,\mathrm{d}x$

Problem 2. (3 points) Evaluate the following integral or show that it diverges: $\int_{-2}^2 \frac{1}{3x+1}\,\mathrm{d}x$

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Problem 3. (7 points) Evaluate the following indefinite integral: $\displaystyle\int \frac{x^2+1}{(x-1)(x+2)(x+3)}\,\mathrm{d}x$

Problem 4. (4 points) Determine the shape (but not the exact numbers involved) of the partial fraction decompositions of:

(a) $\displaystyle\frac{2x^3-7x+1}{(x-1)^3(x+4)} =$

(b) $\displaystyle\frac{3x^5+2x}{(x^2+3)(x+2)} =$

Problem 5. (6 points) Evaluate the following indefinite integral: $\int \sin^3(3x)\cos^6(3x)\,\mathrm{d}x$

Problem 6. (4 points) Evaluate the following indefinite integral: $\int \frac{1}{\sqrt{4-x^2}}\,\mathrm{d}x$.

(extra scratch paper)