

# Midterm #2 – Practice

MATH 126 — Calculus II  
Midterm: Thursday, Oct 24, 2024

Please print your name:

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**Bonus challenge.** Let me know about any typos you spot in the posted solutions (or lecture sketches). Any mathematical typo, that is not yet fixed by the time you send it to me, is worth a bonus point.

**Reminder.** A nongraphing calculator (equivalent to the TI-30XIIS) is allowed on the exam (but not needed). No notes or further tools of any kind will be permitted on the midterm exam.

**Problem 1.** Go over all the quizzes since the first midterm exam!

To help you with that, there is a version of each quiz posted on our course website without solutions (of course, there are solutions, too).

**Problem 2.** Evaluate the integral  $\int_1^2 x^3 \ln(x) dx$ .

**Problem 3.** Determine the shape (but not the exact numbers involved) of the partial fraction decompositions of:

(a)  $\frac{3x^2 - 2}{x^2(x - 1)(x + 2)}$

(b)  $\frac{x^9 + 1}{x(x + 2)(x^2 + 1)^2}$

**Problem 4.** Evaluate  $\int_3^4 \frac{x^3 - 2x^2 - 4}{x^3 - 2x^2} dx$ .

**Problem 5.** Evaluate the following indefinite integrals:

(a)  $\int \cos^4(5x) \sin^3(5x) dx$

(b)  $\int \cos^5(3x) \sin^2(3x) dx$

**Problem 6.** Evaluate the following indefinite integrals:

(a)  $\int \frac{1}{\sqrt{4 - 9x^2}} dx$

(b)  $\int \frac{1}{x^2 \sqrt{9x^2 - 4}} dx$

**Problem 7.** Evaluate the following integrals or show that they diverge.

(a)  $\int_{-2}^2 \frac{1}{x + 1} dx$

(b)  $\int_2^3 \frac{1}{\sqrt{3x - 6}} dx$

**Problem 8.** Evaluate  $\int x^3 \cos(x^2 + 1) dx$ .