

MATH 22 PRACTICE EXAM ON INTEGRATION BY PARTS

Name:

Section:

Instructions:

- (1) Books, notes, and calculators are not permitted.
- (2) Simplify as instructed. On some problems, unsimplified correct answers will not receive full credit.
- (3) Show your work as instructed. On some problems, correct answers without justification will not receive full credit.

(1)

(2)

(3)

(4)

(5)

(6)

Total

Problem 1. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

Which of the following is the general antiderivative of $x^2 \cos(x)$?

- A. $\frac{x^3}{3} \sin(x) + C$.
- B. $x^2 \sin(x) - 2x \sin(x) + C$.
- C. $x^2 \sin(x) + 2x \sin(x) + C$.
- D. $x^2 \sin(x) + 2x \cos(x) - 2 \sin(x) + C$.
- E. $x^2 \sin(x) - 2x \sin(x) + 2 \sin(x) + C$.

Problem 2. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

The integral

$$\int_a^b f(x)g'(x) dx$$

is equal to which of the following?

- A. $f(x)g(x)]_a^b - \int_a^b g(x)f'(x) dx$.
- B. $f'(x)g'(x)]_a^b - \int_a^b f(x)g'(x) dx$.
- C. $f(x)g'(x)]_a^b - \int_a^b g(x)f'(x) dx$.
- D. $f'(x)g'(x)]_a^b - \int_a^b g(x)f'(x) dx$.
- E. None of these.

Problem 3. (15 pts.) Evaluate the integral

$$\int e^x \sin x \, dx.$$

Show your work and simplify your answer.

Problem 4. (15 pts.) Evaluate the integral

$$\int_1^2 x^2 e^x dx.$$

Show your work and simplify your answer.

Problem 5. (15 pts.) Evaluate the integral

$$\int_1^4 \ln(x) \, dx.$$

Show your work and simplify your answer.

Problem 6. (15 pts.) Evaluate the integral

$$\int_0^{\pi} x^3 \cos x \, dx.$$

Show your work and simplify your answer.