

MATH 22 PRACTICE EXAM ON TRIGONOMETRIC INTEGRALS

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)

(7)

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 indefinite integrals is equal to

$$\frac{\sin^9(4x)}{9} + C?$$

- A. $\int \sin^8(4x) dx$.
- B. $\int \sin^8(4x) 4 dx$.
- C. $\int \sin^8(4x) \cos(4x) dx$.
- D. $\int \sin^8(4x) \cos(4x) 4 dx$.
- E. None of these.

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

Which of the following indefinite integrals is equal to

$$\frac{\cos^2(3x)}{2} + C?$$

- A. $\int \cos(3x) dx$.
- B. $\int \cos(3x) 3 \sin(3x) dx$.
- C. $\int \cos(3x) (-\sin(3x)) dx$.
- D. $\int \cos(3x) (-3 \sin(3x)) dx$.
- E. None of these.

Problem 3. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

Which of the following indefinite integrals is equal to

$$\frac{\sec^6(x)}{6} + C?$$

- A. $\int \sec^5(x) dx.$
- B. $\int \sec^5(x) \tan(x) dx.$
- C. $\int \sec^5(x) \tan^2(x) dx.$
- D. $\int \sec^6(x) \tan(x) dx.$
- E. None of these.

Problem 4. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

Which of the following indefinite integrals is equal to

$$\frac{\tan^4(x)}{4} + C?$$

- A. $\int \tan^3(x) dx.$
- B. $\int \tan^3(x) \sec(x) dx.$
- C. $\int \tan^3(x) \sec^2(x) dx.$
- D. $\int \tan^4(x) \sec^2(x) dx.$
- E. None of these.

Problem 5. (15 pts.) Evaluate the indefinite integral $\int \sin^6(x) dx$. Show your work and simplify your answer.

Problem 6. (15 pts.) Find the area which lies between the curves $\cos(x)$ and $\cos^2(x)$, from $x = 0$ to $x = \pi/2$. Show your work and simplify your answer.

Problem 7. (15 pts.) Evaluate the indefinite integral

$$\int \sec^4(3x) \tan^3(3x) dx$$

and state your answer as a function of x . Show your work and simplify your answer.