

Name:

4-digit code:

- Write your name and the last 4 digits of your SSN in the space provided above.
- This quiz has six (6) pages, including this one.
- Enter your answer in the box(es) provided.
- You must show sufficient work to justify all answers unless otherwise stated in the problem. Correct answers with inconsistent work may not be given credit. All the questions are graded as “all-or-nothing”
- Each problem is worth one point, except the problem 5 (worth 2 points)
- No books, notes or calculators may be used on this quiz.

Page	Max. points	Your points
2	4	
3	2	
4	1	
5	2	
6	1	
<b>Total</b>	10	

**Problem 1** (4 pts). Evaluate each integral:

(a)  $\int \csc^2 x \, dx =$

(b)  $\int \frac{1}{\csc x} \, dx =$

(c)  $\int \frac{x+1}{x} \, dx =$

(d)  $\int \frac{x}{x+1} \, dx =$

**Problem 2** (1 pts). Use **integration by parts** to evaluate the integral  $\int x e^{2x} dx$ .

$\int x e^{2x} dx =$

**Problem 3** (1 pts). Evaluate the improper integral  $\int_1^{\infty} \frac{dx}{x^3}$ .

$$\int_1^\infty \frac{dx}{x^3} =$$

**Problem 4** (1 pts). Use the trigonometric substitution  $x = a \sec \theta$  to evaluate the integral  $\int \frac{dx}{\sqrt{x^2 - 9}}$ .

$$\int \frac{dx}{\sqrt{x^2 - 9}} =$$

**Problem 5** (2 pts). Evaluate the integral  $\int \sin^2 x \cos^2 x \, dx$ .

To make it easier, you may use trigonometric simplification and any of the following reduction formulas (for  $n = 2$  and for  $n = 4$ )

$$\begin{aligned}\int \sin^n x \, dx &= -\frac{1}{n} \sin^{n-1} x \cos x + \frac{n-1}{n} \int \sin^{n-2} x \, dx \\ \int \cos^n x \, dx &= \frac{1}{n} \cos^{n-1} x \sin x + \frac{n-1}{n} \int \cos^{n-2} x \, dx\end{aligned}$$

$$\int \sin^2 x \cos^2 x \, dx =$$

**Problem 6** (1 pts). Use **partial fractions** to evaluate the integral  $\int \frac{dx}{x^2 + x - 2}$ .

$$\int \frac{dx}{x^2 + x - 2} =$$