

Math 122
Exam 1

1. Evaluate the following indefinite integrals

(a) $\int x \cos x \, dx$

(b) $\int \frac{\cos\sqrt{x}}{\sqrt{x}} \, dx$

2. Find the exact value of $\int_0^1 x(1-x)^{1998} \, dx$.

3. Evaluate the following improper integrals.

(a) $\int_0^\infty e^{-5x} \, dx$

(b) $\int_0^4 \frac{1}{\sqrt{x}} \, dx$

5. Determine whether $\int_\pi^\infty \frac{\sin^2 x}{x^2} \, dx$ converges or diverges.

6. Use the identity $\cos^2 x + \sin^2 x = 1$ to find $\int \sin^3 x \, dx$.

7. Use SIMP(2) to estimate $\int e^{-x^2} \, dx$.

8. Find $\int \frac{x+2}{x^2+x} \, dx$.