

Class:

Student ID:

Name:

1. (4%) Evaluate $\int (3 \sin x + 4)^5 \cos x \, dx$.

2. (6%) Evaluate $\int \frac{x^2}{x^3 + 5} \, dx$.

3. (6%) Prove that if u and v are functions of x have continuous derivatives, then

$$\int u \, dv = uv - \int v \, du.$$

4. (6%) Evaluate $\int x^2 \ln 2x \, dx$.

5. (8%) Evaluate $\int x^2 \sin x \, dx$.

6. (8%) Evaluate $\int e^{2x} \sin x \, dx$.

7. (6%) Evaluate $\int \frac{5x - 2}{x^2 - 4} \, dx$.

8. (8%) Use a partial fractions to find an antiderivative of $f(x) = \frac{x + 2}{x^3 + x}$.

9. (6%) Evaluate $\int \sin^5 x \cos^2 x \, dx$.

10. (6%) Evaluate $\int \sin^4 x \cos^3 x \, dx$.

11. (6%) Evaluate $\int \tan^5 x \sec^3 x \, dx$.

12. (6%) Evaluate $\int \tan^4 x \sec^4 x \, dx$.

13. (8%) Evaluate $\int \frac{1}{x\sqrt{4 - x^2}} \, dx$.

14. (8%) Evaluate $\int x^3 \sqrt{x^2 + 9} \, dx$.

15. (8%) Evaluate $\int x\sqrt{x^2 - 4} \, dx$, for $x > 2$.