
Topics:

• Integration by substitution.
• Integration by parts.

You are to provide full solutions to the following problems. You are allowed, and encouraged to collaborate with your classmates, use your notes and textbook and ask the TA for guidance. Direct copying of solutions is not encouraged, nor is it allowed or ethical.

Last name: ___________________________ First name: ___________________________

Student number: _______________________
1. Evaluate $\int \frac{x^5}{3 - 5x^3} \, dx$.

2. Evaluate $\int \frac{1}{1 + \sqrt{x}} \, dx$. 
3. Evaluate \[ \int \frac{\sin^3 x}{2 + \cos x} \, dx. \]

4. Evaluate \[ \int x^9 \ln x \, dx. \]
5. Evaluate \( \int_0^{\pi/2} x \sin 3x \, dx \).

6. Evaluate \( \int x^{3/2} \ln 2x \, dx \).
7. Evaluate $\int x \arctan x \, dx$.

8. Evaluate $\int \sin (3 \ln x) \, dx$. 
Bonus question: Evaluate $\int \sin \sqrt{x} \, dx$. 