
The Substitution Rule

Solutions should show all of your work, not just a single final answer.

1. Evaluate each of the following indefinite integrals.

(a) $\int x^2 \sin(x^3) dx$

(b) $\int x\sqrt{4x+1} dx.$

(c) $\int \frac{x}{x^2+1} dx.$

(d) $\int \frac{1}{x \ln x} dx.$

2. Evaluate each of the following definite integrals.

(a) Rewrite $\int_0^1 x^2(1+2x^3)^5 dx$

(b) Rewrite $\int_0^{\pi/3} \frac{\sin x}{\cos^2 x} dx$

(c) Rewrite $\int_0^{\pi/3} \sin x \cos x dx$

(d) Rewrite $\int_2^3 xe^{-x^2} dx$

3. Give an example of an indefinite integral (no bounds) that can be evaluated using the substitution $u = \sec(2x)$, then evaluate your integral.