

Section 5.5

After viewing the lecture videos and reading the textbook, you should be able to answer the following questions:

1. The substitution method was derived from looking at which derivative rule?
2. The substitution method to evaluate $\int f(g(x)) \cdot g'(x) dx$ follows these three steps:

Step 1: Substitute $u = g(x)$ and $du = \left(\frac{du}{dx}\right) dx = g'(x)dx$ to obtain $\int f(u) du$.

Step 2: Integrate with respect to u .

Step 3: Replace u by $g(x)$.

Evaluate the following integrals – clearly showing the three steps above:

- a. $\int 4x(2x^2 + 4)^5 dx$
- b. $\int 5 \sec 5x \tan 5x dx$ – Hint: use $u = \sec 5x$
- c. $\int \frac{3x^2}{x^3+3} dx$