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. $\int 5 \sec 5x \tan 5x\, dx$

   c. $\int \frac{3x^2}{x^3+3}\, dx$