MATH 136, section 1 – Calculus 2
Integration By Substitution Practice
February 7, 2014

Each of the following integrals can be done by the method of u-substitution:

1. Determine the appropriate function u,
2. Compute du,
3. Change the integral to an equivalent form in the new variable u. If it is a definite integral, you can convert the limits of integration as well.
4. Integrate, then
5. Resubstitute u to express the answer in terms of the original variable (indefinite integral cases), or evaluate (definite integral cases).

- $\displaystyle\int x\sqrt{x^2+16}\,dx$
- $\displaystyle\int \cos\theta e^{1+\sin\theta}\,d\theta$
- $\displaystyle\int_{\pi/4}^{\pi/2} \cos^3(4\theta)\sin(4\theta)\,d\theta$
- $\displaystyle\int \frac{1}{\sqrt{1-4x^2}}\,dx$
- $\displaystyle\int_0^{1/4} \frac{x}{\sqrt{1-4x^2}}\,dx$
- $\displaystyle\int \frac{1}{x\ln(x)}\,dx$
- $\displaystyle\int \frac{\cos(\sqrt{y})}{\sqrt{y}}\,dy.$