

MATH 136 – Calculus 2

A Short Table of Reduction Formulas for Trigonometric Integrals

- (SC1) For all $n \geq 1$:

$$\int \sin^n(u) \, du = \frac{-\sin^{n-1}(u) \cos(u)}{n} + \frac{n-1}{n} \int \sin^{n-2}(u) \, du.$$

- (SC2) For all $n \geq 1$:

$$\int \cos^n(u) \, du = \frac{\cos^{n-1}(u) \sin(u)}{n} + \frac{n-1}{n} \int \cos^{n-2}(u) \, du.$$

- (SC3 and SC4)

$$\begin{aligned} & \int \sin^n(u) \cos^m(u) \, du \\ &= \begin{cases} \frac{-\sin^{n-1}(u) \cos^{m+1}(u)}{n+m} + \frac{n-1}{n+m} \int \sin^{n-2}(u) \cos^m(u) \, du \\ \frac{\sin^{n+1}(u) \cos^{m-1}(u)}{n+m} + \frac{m-1}{n+m} \int \sin^n(u) \cos^{m-2}(u) \, du \end{cases} \end{aligned}$$

(You can use the first of these any time $n \geq 2$ and the second any time $m \geq 2$ – including cases where the other exponent is negative.)

- (ST1)

$$\int \tan^n(u) \, du = \frac{\tan^{n-1}(u)}{n-1} - \int \tan^{n-2}(u) \, du.$$

- (ST2)

$$\int \tan(u) \, du = -\ln |\cos(u)| + C$$

- (ST3)

$$\int \sec^n(u) \, du = \frac{\tan(u) \sec^{n-2}(u)}{n-1} + \frac{n-2}{n-1} \int \sec^{n-2}(u) \, du.$$

- (ST4)

$$\int \sec(u) \, du = \ln |\sec(u) + \tan(u)| + C$$