Table of Integrals

$$D_x F(x) = f(x) \Rightarrow \int f(x)dx = F(x) + C$$

$$\int dx = x + C$$

$\int kdx = kx + C$, where k is any constant

$\int [af(x) + bg(x)]dx = a\int f(x)dx + b\int g(x)dx$, where a, b are any constants

$\int kf(x)dx = k\int f(x)dx$ for any constant k.

$$\int [f(x) + g(x)]dx = \int f(x)dx + \int g(x)dx$$

$$\int [f(x) - g(x)]dx = \int f(x)dx - \int g(x)dx$$

$$\int x^n dx = \frac{1}{n+1}x^{n+1} + C,\ n \neq -1$$

$$\int \frac{1}{u}du = \ln|u| + C$$

$$\int \cos x dx = \sin x + C$$

$$\int \sin x dx = -\cos x + C$$

$$\int [f(x)]^n D_x f(x)dx = \frac{1}{n+1}[f(x)]^{n+1} + C,\ n \neq -1$$

$\int u^n du = \frac{1}{n+1}u^{n+1} + C$, $n \neq -1$, where $u(x)$ is any ***function*** of x.

$$\int e^u du = e^u + C \quad \int a^x dx = \frac{1}{\ln a}a^x + C$$

$$\int \frac{1}{\sqrt{1-x^2}}dx = \sin^{-1} x + C$$

$$\int \frac{1}{1+x^2}dx = \tan^{-1} x + C$$

NOTE: typo in 150A notes last semester had this formula incorrect

$$\int \frac{1}{x\sqrt{x^2-1}}dx = \sec^{-1}|x| + C$$