

# TABLE OF DERIVATIVES

1.  $\frac{d}{dx}(c) = 0$ ,  $c$  is a constant
2.  $\frac{d}{dx}(cu) = c \frac{du}{dx}$ ,  $u = u(x)$
3.  $\frac{d}{dx}(u^n) = nu^{n-1} \frac{du}{dx}$
4.  $\frac{d}{dx}(u \pm v) = \frac{du}{dx} \pm \frac{dv}{dx}$
5.  $\frac{d}{dx}(uv) = u \frac{dv}{dx} + v \frac{du}{dx}$ ,  $v = v(x)$
6.  $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$ ,  $v \neq 0$
7.  $\frac{d}{dx}(\sin u) = \cos u \frac{du}{dx}$
8.  $\frac{d}{dx}(\cos u) = -\sin u \frac{du}{dx}$
9.  $\frac{d}{dx}(\tan u) = \sec^2 u \frac{du}{dx}$
10.  $\frac{d}{dx}(\cot u) = -\csc^2 u \frac{du}{dx}$
11.  $\frac{d}{dx}(\sec u) = \sec u \tan u \frac{du}{dx}$
12.  $\frac{d}{dx}(\csc u) = -\csc u \cot u \frac{du}{dx}$
13.  $\frac{d}{dx}(\arcsin u) = \frac{1}{\sqrt{1-u^2}} \frac{du}{dx}$ ,  $-1 < u < 1$
14.  $\frac{d}{dx}(\arccos u) = -\frac{1}{\sqrt{1-u^2}} \frac{du}{dx}$ ,  $-1 < u < 1$
15.  $\frac{d}{dx}(\arctan u) = \frac{1}{1+u^2} \frac{du}{dx}$
16.  $\frac{d}{dx}(\ln u) = \frac{1}{u} \frac{du}{dx}$
17.  $\frac{d}{dx}(\log_a u) = \frac{1}{u \ln a} \frac{du}{dx}$ ,  $a \neq 0, 1$
18.  $\frac{d}{dx}e^u = e^u \frac{du}{dx}$
19.  $\frac{d}{dx}a^u = a^u \ln a \frac{du}{dx}$

# TABLE OF INTEGRALS

1.  $\int du = u + C$
2.  $\int adu = au + C$ ,  $a$  is a constant
3.  $\int [f(u) + g(u)]du = \int f(u)du + \int g(u)du$

4.  $\int u^n du = \frac{u^{n+1}}{n+1} + C$ ,  $n \neq -1$
5.  $\int \frac{1}{u} du = \ln |u| + C$
6.  $\int e^u du = e^u + C$
7.  $\int a^u du = \frac{a^u}{\ln a} + C$ ,  $a > 0$ ,  $a \neq 1$
8.  $\int \sin u du = -\cos u + C$
9.  $\int \cos u du = \sin u + C$
10.  $\int \tan u du = \ln |\sec u| + C$
11.  $\int \cot u du = \ln |\sin u| + C$
12.  $\int \csc u du = \ln |\csc u - \cot u| + C$
13.  $\int \sec u du = \ln |\sec u + \tan u| + C$
14.  $\int \sec^2 u du = \tan u + C$
15.  $\int \csc^2 u du = -\cot u + C$
16.  $\int \tan^2 u du = \tan u - u + C$
17.  $\int \cot^2 u du = -\cot u - u + C$
18.  $\int \sin^2 u du = \frac{u}{2} - \frac{1}{4} \sin 2u + C$
19.  $\int \cos^2 u du = \frac{u}{2} + \frac{1}{4} \sin 2u + C$
20.  $\int \sec u \tan u du = \sec u + C$
21.  $\int \csc u \cot u du = -\csc u + C$

# TRIGONOMETRIC FORMULAS

$$\begin{aligned} \sin(A \pm B) &= \sin A \cos B \pm \cos A \sin B \\ \cos(A \pm B) &= \cos A \cos B \mp \sin A \sin B \\ 2 \sin A \cos B &= \sin(A+B) + \sin(A-B) \\ 2 \sin A \sin B &= \cos(A-B) - \cos(A+B) \\ 2 \cos A \cos B &= \cos(A+B) + \cos(A-B) \\ \sin 2A &= 2 \sin A \cos A \\ \cos 2A &= \cos^2 A - \sin^2 A \\ \cos 2A &= 2 \cos^2 A - 1 \\ \sin 2A &= 2 \sin A \cos A \\ \sin^2 A + \cos^2 A &= 1 \\ \sec^2 A - \tan^2 A &= 1 \\ \csc^2 A - \cot^2 A &= 1 \\ \sin^2 A &= \frac{1}{2} - \frac{1}{2} \cos 2A \\ \cos^2 A &= \frac{1}{2} + \frac{1}{2} \cos 2A \end{aligned}$$