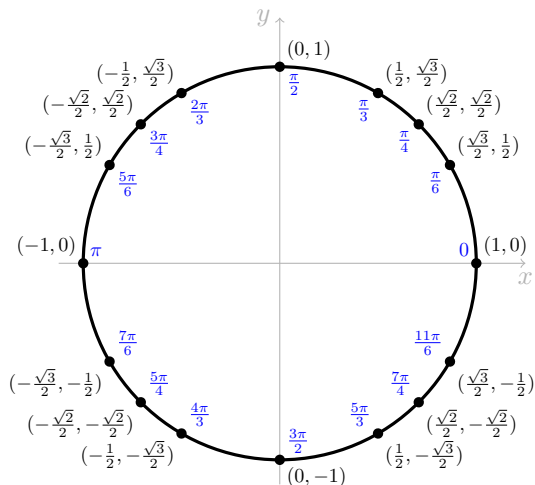


Formula Sheet

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Common Angles



Selected Derivatives

- $\frac{d}{dx} \tan x = \sec^2 x$
- $\frac{d}{dx} \sec x = \sec x \tan x$
- $\frac{d}{dx} \sin^{-1} x = \frac{1}{\sqrt{1-x^2}}$
- $\frac{d}{dx} \tan^{-1} x = \frac{1}{1+x^2}$
- $\frac{d}{dx} \sec^{-1} x = \frac{1}{|x|\sqrt{x^2-1}}$

Selected Integrals

- $\int a^u du = \frac{a^u}{\ln a} + C$
- $\int \frac{du}{\sqrt{a^2 - u^2}} = \arcsin \frac{u}{a} + C$
- $\int \frac{du}{a^2 + u^2} = \frac{1}{a} \arctan \frac{u}{a} + C$
- $\int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a} \operatorname{arcsec} \frac{|u|}{a} + C$
- $\int \sec u du = \ln |\sec u + \tan u| + C$

Arc Length

$$L = \int \sqrt{1 + (y')^2} dx$$

Surface Area of Revolution

$$S = \int 2\pi r \sqrt{1 + (y')^2} dx$$

Half-Angle Formulas

- $\sin^2 \theta = \frac{1 - \cos 2\theta}{2}$
- $\cos^2 \theta = \frac{1 + \cos 2\theta}{2}$

Work

$$W = \int F dx \quad \text{or} \quad W = \int x dF$$

Alternating Series Error

$$|S - S_n| \leq a_{n+1}$$

Taylor Polynomial of Degree n

$$P_n(x) = \sum_{k=0}^n \frac{f^{(k)}(c)}{k!} (x-c)^k$$

Taylor Polynomial Remainder

$$R_n(x) = \frac{f^{(n+1)}(z)}{(n+1)!} (x-c)^{n+1}$$

Radius of Convergence

$$R = \lim_{n \rightarrow \infty} \frac{|a_n|}{|a_{n+1}|}$$

Important Maclaurin Series

- $e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$
- $\sin x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$
- $\cos x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}$
- $\arctan x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{2n+1}$
- $\ln(1+x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{n+1}}{n+1}$
- $\frac{1}{1-x} = \sum_{n=0}^{\infty} x^n$