

Formula Sheet

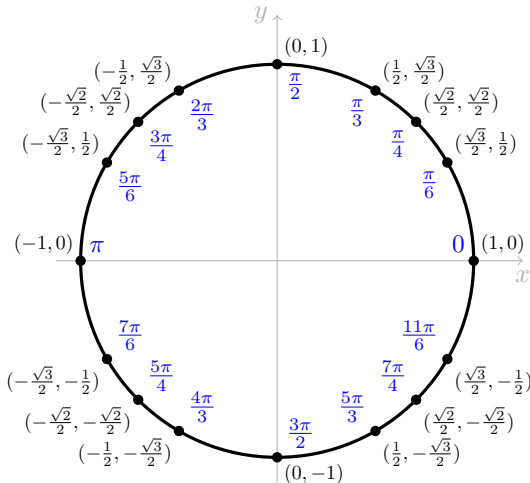
Quadratic Formula

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

Point-Slope Form

$$y - y_1 = m(x - x_1)$$

Common Angles



Trigonometry Ratios

- $\tan x = \frac{\sin x}{\cos x}$ $\cot x = \frac{\cos x}{\sin x}$
- $\sec x = \frac{1}{\cos x}$ $\csc x = \frac{1}{\sin x}$

Angle Addition Identities

- $\cos(a + b) = \cos a \cos b - \sin a \sin b$
- $\sin(a + b) = \sin a \cos b + \sin b \cos a$

Trigonometry Limits

- $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$
- $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x} = 0$

Definition of Derivative

- $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$, or
- $f'(a) = \lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a}$

Selected Derivatives

- $\frac{d}{dx} \tan x = \sec^2 x$
- $\frac{d}{dx} \sec x = \sec x \tan x$
- $\frac{d}{dx} \cot x = -\csc^2 x$
- $\frac{d}{dx} \csc x = -\csc x \cot x$

Linear Approximation

- $f(x) \approx f(a) + f'(a)(x - a)$

Error and Relative Error

- $dy \approx$ the error in y
- $\frac{dy}{y} \approx$ the relative (percent) error in y

Newton's Method

- $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$

Summation Formulas

- $\sum_{i=1}^n i = \frac{n(n+1)}{2}$
- $\sum_{i=1}^n i^2 = \frac{n(n+1)(2n+1)}{6}$

Riemann Sum

- $A \approx \sum_{n=1}^N f(x_n) \Delta x$ where
- $\Delta x = \frac{b-a}{N}$ and
- $x_n = a + n\Delta x$

Average Value of a Function

- $\frac{1}{b-a} \int_a^b f(x) dx$