

Derivatives

- power: $\frac{d}{dx}(x^n) = nx^{n-1}$
- exponential: $\frac{d}{dx}(e^x) = e^x$
- logarithmic: $\frac{d}{dx}(\ln x) = \frac{1}{x}$
- trig:
 - $\frac{d}{dx}(\sin x) = \cos x$
 - $\frac{d}{dx}(\cos x) = -\sin x$
 - $\frac{d}{dx}(\tan x) = \sec^2 x$
 - $\frac{d}{dx}(\cot x) = -\csc^2 x$
 - $\frac{d}{dx}(\sec x) = \sec x \tan x$
 - $\frac{d}{dx}(\csc x) = -\csc x \cot x$
- inverse trig:
 - $\frac{d}{dx}(\sin^{-1} x) = \frac{1}{\sqrt{1-x^2}}$
 - $\frac{d}{dx}(\cos^{-1} x) = -\frac{1}{\sqrt{1-x^2}}$
 - $\frac{d}{dx}(\tan^{-1} x) = \frac{1}{1+x^2}$
- product, quotient:
 - $\frac{d}{dx}(u \cdot v) = u' \cdot v + u \cdot v'$

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{u' \cdot v - u \cdot v'}{v^2}$$

Antiderivatives

- power: $\int u^n du = \frac{u^{n+1}}{n+1} + C$
- exponential: $\int e^u du = e^u + C$
- logarithmic: $\int \frac{du}{u} = \ln |u| + C$
- trig:
 - $\int \cos u du = \sin u + C$
 - $\int \sin u du = -\cos u + C$
 - $\int \sec^2 u du = \tan u + C$
 - $\int \csc^2 u du = -\cot u + C$
 - $\int \sec u \tan u du = \sec u + C$
 - $\int \csc u \cot u du = -\csc u + C$
- inverse trig:
 - $\int \frac{du}{\sqrt{1-u^2}} = \sin^{-1} u + C$
 - $-\int \frac{du}{\sqrt{1-u^2}} = \cos^{-1} u + C$
 - $\int \frac{du}{1+u^2} = \tan^{-1} u + C$