$f'(x)$	$f(x)$	$\int f(x)\,\mathrm{d}x - C$
$n \cdot x^{n-1}$	x^n	$\frac{1}{n+1}x^{n+1},\ {\scriptstyle n\neq -1}$
$\frac{1}{x}$	$\log\lvert x\rvert$	$x\log\lvert x\rvert - x$
$\exp(x)$	$\exp(x)$	$\exp(x)$
$\cos(x)$	$\sin(x)$	$-\cos(x)$
$-\sin(x)$	$\cos(x)$	$\sin(x)$
$\underbrace{1+\tan(x)^2}_{=\frac{1}{\cos(x)^2}}$	$\tan(x)$	$-\log\lvert\cos(x)\rvert$
$\frac{1}{\sqrt{1-x^2}}$	$\arcsin(x)$	$x\arcsin(x) + \sqrt{1-x^2}$
$-\frac{1}{\sqrt{1-x^2}}$	$\arccos(x)$	$x\arccos(x) - \sqrt{1-x^2}$
$\frac{1}{1+x^2}$	$\arctan(x)$	$x\arctan(x) - \frac{1}{2}\ln(1+x^2)$
$2\sin(x)\cos(x)$	$\sin(x)^2$	$\frac{1}{2}(x - \sin(x)\cos(x))$
$-2\sin(x)\cos(x)$	$\cos(x)^2$	$\frac{1}{2}(x + \sin(x)\cos(x))$
$2\tan(x)^3 + 2\tan(x)^2$	$\tan(x)^2$	$\tan(x) - x$
$\cosh(x)$	$\sinh(x)$	$\cosh(x)$
$\sinh(x)$	$\cosh(x)$	$\sinh(x)$
$\underbrace{1-\tanh(x)^2}_{=\frac{1}{\cosh(x)^2}}$	$\tanh(x)$	$\log(\cosh(x))$
$\frac{1}{\sqrt{x^2+1}}$	$\operatorname{arcsinh}(x)$	$x\operatorname{arcsinh}(x) - \sqrt{x^2+1}$
$\frac{1}{\sqrt{x^2-1}}$	$\operatorname{arccosh}(x)$	$x\operatorname{arccosh}(x) - \sqrt{x^2-1}$
$\frac{1}{1-x^2}$	$\operatorname{arctanh}(x)$	$x\operatorname{arctanh}(x) + \ln(1-x^2)$
$\frac{-1}{(ax+b)^2}$	$\frac{1}{ax+b}$	$\frac{1}{a}\log\lvert ax+b\rvert$
$\frac{ad-bc}{(cx+d)^2}$	$\frac{ax+b}{cx+d}$	$\frac{a}{c}x + \frac{ad-bc}{c^2}\log\lvert cx+d\rvert$
$\frac{-2x}{(x^2-a^2)^2}$	$\frac{1}{x^2-a^2}$	$\frac{1}{2a}\ln\left\lvert\frac{x-a}{x+a}\right\rvert$
$\frac{-2x}{(x^2+a^2)^2}$	$\frac{1}{x^2+a^2}$	$\frac{1}{a}\arctan\left(\frac{1}{a}x\right)$

Trigonometric Identities.

- $\cos(-z) = \cos(z)$, **'even' function.**
- $\sin(-z) = -\sin(z)$, **'odd' function.**
- $\sin(x) = \cos(x + \frac{\pi}{2})$
- $e^{iz} = \cos(z) + i\sin(z)$, **Euler.**
- $\sin(z)^2 + \cos(z)^2 = 1$, **Pythagoras.**
- $\sin(z) = \frac{1}{2i}(e^{iz} - e^{-iz})$
- $\cos(z) = \frac{1}{2}(e^{iz} + e^{-iz})$

Addition.

- $\sin(z+w) = \sin(z)\cos(w) + \cos(z)\sin(w)$
- $\sin(z-w) = \sin(z)\cos(w) - \cos(z)\sin(w)$
- $\cos(z+w) = \cos(z)\cos(w) - \sin(z)\sin(w)$
- $\cos(z-w) = \cos(z)\cos(w) + \sin(z)\sin(w)$
- $\sin(2z) = 2\sin(z)\cos(z)$
- $\cos(2z) = \cos(z)^2 - \sin(z)^2$
- $\sin(z) + \sin(w) = 2\sin(\frac{1}{2}(z+w))\cos(\frac{1}{2}(z-w))$
- $\sin(z) - \sin(w) = 2\cos(\frac{1}{2}(z+w))\sin(\frac{1}{2}(z-w))$
- $\cos(z) + \cos(w) = 2\cos(\frac{1}{2}(z+w))\cos(\frac{1}{2}(z-w))$
- $\cos(z) - \cos(w) = -2\sin(\frac{1}{2}(z+w))\sin(\frac{1}{2}(z-w))$

Multiplication.

- $\sin(z)\sin(w) = \frac{1}{2}(\cos(z-w) - \cos(z+w))$
- $\sin(z)\cos(w) = \frac{1}{2}(\sin(z+w) + \sin(z-w))$
- $\cos(z)\cos(w) = \frac{1}{2}(\cos(z-w) + \cos(z+w))$
- $\sin(z)^2 = \frac{1}{2}(1 - \cos(2z))$
- $\cos(z)^2 = \frac{1}{2}(1 + \cos(2z))$

Hyperbolic Identities.

- $\cosh(-z) = \cosh(z)$, **'even' function.**
- $\sinh(-z) = -\sinh(z)$, **'odd' function.**
- $e^x = \cosh(x) + \sinh(x)$
- $\cosh(x)^2 - \sinh(x)^2 = 1$
- $\sinh(x) = \frac{1}{2}(e^x - e^{-x})$
- $\cosh(x) = \frac{1}{2}(e^x + e^{-x})$
- $\operatorname{arcsinh}(x) = \ln(x + \sqrt{x^2+1})$
- $\operatorname{arccosh}(x) = \ln(x + \sqrt{x^2-1})$
- $\operatorname{arctanh}(x) = \frac{1}{2}\ln\left(\frac{1+x}{1-x}\right)$

Taylor Series Expansions.

- $f(z) = \sum_{n=0}^{\infty} \frac{f^{(n)}(c)(z-c)^n}{n!} = f(c) + f'(c)(z-c) + \frac{f''(c)(z-c)^2}{2!} + \ldots$
- $\sin(z) = \sum_{n=0}^{\infty} \frac{(-1)^n z^{2n+1}}{(2n+1)!} = z - \frac{z^3}{3!} + \frac{z^5}{5!} - \ldots$
- $\cos(z) = \sum_{n=0}^{\infty} \frac{(-1)^n z^{2n}}{(2n)!} = 1 - \frac{z^2}{2!} + \frac{z^4}{4!} - \ldots$
- $\exp(z) = \sum_{n=0}^{\infty} \frac{z^n}{n!} = 1 + z + \frac{z^2}{2!} + \frac{z^3}{3!} + \ldots$
- $\log(1+z) = -\sum_{n=0}^{\infty} \frac{(-x)^n}{n} = x - \frac{x^2}{2} + \frac{x^3}{3} - \ldots$
- $\frac{1}{1-x} = \sum_{n=0}^{\infty} x^n = 1 + x + x^2 + x^3 + \ldots$

Derivative Rules.

- **Linearity:** $\alpha \in \mathbb{R} : (\alpha f \pm g)' = \alpha f' \pm g'$
- **Multiplication:** $(f \cdot g)' = f'g + fg'$
- **Division:** $\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$
- **Chain Rule:** $(f \circ g)' = (f' \circ g) \cdot g'$
- **Inverse:** $(f^{-1})' = \frac{1}{f' \circ f^{-1}} \overset{\circ f}{\iff} (f^{-1}) \circ f = \frac{1}{f'}$

Integration Tricks.

- **Linearity:** $\alpha \in \mathbb{R} : \int(\alpha f + g)\,\mathrm{d}x = \alpha \cdot \int f\,\mathrm{d}x + \int g\,\mathrm{d}x$
- **Partial Integration:** $\int(f \cdot g')\,\mathrm{d}x = fg - \int(f' \cdot g)\,\mathrm{d}x$
- **Substitution:** $\int_a^b (f \circ \phi) \cdot \phi'\,\mathrm{d}x = \int_{\phi(a)}^{\phi(b)} f\,\mathrm{d}x$
- **Partial Fraction Decomposition:** to do, sry :∪