$$\cos x = \frac{e^{ix}+e^{-ix}}{2}$$
$$\sin x = \frac{e^{ix}-e^{-ix}}{2i}$$
$$\sin^2 x + \cos^2 x = 1$$
$$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$$
$$\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$$
$$\sin 2x = 2 \sin x \cos x$$
$$\cos 2x = \cos^2 x - \sin^2 x$$
$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}$$
$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}$$
$$\cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}$$
$$\sin x \sin y = -\frac{1}{2}\left[\cos(x+y) - \cos(x-y)\right]$$
$$\sin x \cos y = \frac{1}{2}\left[\sin(x+y) + \sin(x-y)\right]$$
$$\cos x \cos y = \frac{1}{2}\left[\cos(x+y) + \cos(x-y)\right]$$

$$\cosh x = \frac{e^{x}+e^{-x}}{2}$$
$$\sinh x = \frac{e^{x}-e^{-x}}{2}$$
$$\cosh^2 x - \sinh^2 x = 1$$
$$\sinh 2x = 2 \sinh x \cosh x$$
$$\cosh 2x = \cosh^2 x + \sinh^2 x$$
$$\operatorname{arsinh} x = \ln\left(x + \sqrt{x^2+1}\right)$$
$$\operatorname{arcosh} x = \ln\left(x + \sqrt{x^2-1}\right)$$
$$\operatorname{artanh} x = \frac{1}{2} \ln \frac{1+x}{1-x}$$
$$\operatorname{arcoth} x = \frac{1}{2} \ln \frac{x+1}{x-1}$$

$$(cf)' = cf'$$
$$(f \pm g)' = f' \pm g'$$
$$(fg) = f'g + fg'$$
$$\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$$
$$(f \circ g)' = (f' \circ g)g'$$

$$(x^\alpha)' = \alpha x^{\alpha-1}$$
$$(a^x)' = (\ln a) a^x$$
$$(\log_a x)' = \frac{1}{\ln a}\frac{1}{x}$$
$$(\sin x)' = \cos x$$
$$(\cos x)' = -\sin x$$
$$(\tan x)' = \frac{1}{\cos^2 x} = 1 + \tan^2 x$$
$$(\cot x)' = -\frac{1}{\sin^2 x} = -1 - \cot^2 x$$
$$(\arcsin x)' = -(\arccos x)' = \frac{1}{\sqrt{1-x^2}}$$
$$(\arctan x)' = -(\operatorname{arccot} x)' = \frac{1}{1+x^2}$$
$$(\sinh x)' = \cosh x$$
$$(\cosh x)' = \sinh x$$
$$(\tanh x)' = \frac{1}{\cosh^2 x} = 1 - \tanh^2 x$$
$$(\coth x)' = -\frac{1}{\sinh^2 x} = 1 - \coth^2 x$$
$$(\operatorname{arsinh} x)' = \frac{1}{\sqrt{x^2+1}}$$
$$(\operatorname{arcosh} x)' = \frac{1}{\sqrt{x^2-1}}$$
$$(\operatorname{artanh} x)' = \frac{1}{1-x^2}$$
$$(\operatorname{arcoth} x)' = \frac{1}{1-x^2}$$

$$\int cf(x)\mathrm{d}x = c\int f(x)\mathrm{d}x$$
$$\int f(x) \pm g(x)\mathrm{d}x = \int f(x)\mathrm{d}x \pm \int g(x)\mathrm{d}x$$
$$\int f'(ax+b)\mathrm{d}x = \frac{1}{a} f(ax+b) + C$$
$$\int f^\alpha(x) f'(x)\mathrm{d}x = \begin{cases} \frac{f^{\alpha+1}}{\alpha+1} + C & (\alpha \neq -1) \\ \ln|f(x)| + C & (\alpha = -1) \end{cases}$$
$$\int f(x)g'(x)\mathrm{d}x = f(x)g(x) - \int f'(x)g(x)\mathrm{d}x$$

$$t = \tan \frac{x}{2} \qquad \sin x = \frac{2t}{1+t^2}$$
$$\frac{\mathrm{d}x}{\mathrm{d}t} = \frac{2}{1+t^2} \qquad \cos x = \frac{1-t^2}{1+t^2}$$
$$u = \tanh \frac{x}{2} \qquad \sinh x = \frac{2u}{1-u^2}$$
$$\frac{\mathrm{d}x}{\mathrm{d}u} = \frac{2}{1-u^2} \qquad \cosh x = \frac{1+u^2}{1-u^2}$$

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots + \frac{x^n}{n!} + \cdots$$
$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots + (-1)^n \frac{x^{2n}}{(2n)!} + \cdots$$
$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots + (-1)^{n-1} \frac{x^{2n-1}}{(2n-1)!} + \cdots$$
$$\cosh x = 1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \frac{x^6}{6!} + \cdots + \frac{x^{2n}}{(2n)!} + \cdots$$
$$\sinh x = x + \frac{x^3}{3!} + \frac{x^5}{5!} + \frac{x^7}{7!} + \cdots + \frac{x^{2n-1}}{(2n-1)!} + \cdots$$
$$\frac{1}{1-x} = 1 + x + x^2 + x^3 + \cdots + x^n + \cdots$$
$$(1+x)^\alpha = 1 + \alpha x + \frac{\alpha(\alpha-1)}{2} x^2 + \cdots + \binom{\alpha}{n} x^n + \cdots$$