Integrals:

Fundamental theorem: $\int_a^x f'(t)\,dt = f(x) - f(a)$ $\quad \left[\int_a^x f(t)\,dt\right]' = f(x)$ $\quad$ or $F(x) = \int f(x)\,dx \Leftrightarrow F'(x) = f(x)$

Linearity (on functions): $\int [a \cdot f(x) + b \cdot g(x)]\,dx = a \int f(x)\,dx + b \int g(x)\,dx$

Additivity (on intervals): $\int_a^b f(x)\,dx = \int_a^c f(x)\,dx + \int_c^b f(x)\,dx$

Products (by parts): $\int f'(x)g(x)\,dx = f(x)g(x) - \int f(x)g'(x)\,dx$ $\quad$ or $\int u\,dv = uv - \int v\,du$

Composite functions (substitution): $\int f(u(x))u'(x)\,dx = \int f(u)\,du$

Powers: $\int x^r\,dx = \begin{cases} \frac{1}{r+1}x^{r+1} & \text{if } r \neq -1 \\ \ln|x| & \text{if } r = -1 \end{cases}$

Exponentials and logarithms (base $a > 0$, $\ln = \log_e$, $e = \lim_{n\to\infty}\left[1 + \frac{1}{n}\right]^n \approx 2.7182818284590$): $a^n = \underbrace{a \cdot a \cdot \ldots \cdot a}_{n}$ $\quad a^{1/n} = \sqrt[n]{a}$

$a^{-r} = 1/a^r$ $\quad a^{\log_a x} = x$ $\quad \log_a(a^y) = y$ $\quad a^{x+y} = a^x a^y$ $\quad (a^x)^y = a^{xy}$ $\quad \log_a(xy) = \log_a x + \log_a y$ $\quad \log_a(x^y) = y \log_a x$

$(a^x)' = \ln a\; a^x$ $\quad (\log_a x)' = \frac{1}{\ln a}\frac{1}{x}$ $\quad \int a^x\,dx = \frac{1}{\ln a}a^x$ $\quad \int \log_a x\,dx = \frac{1}{\ln a}(x \ln x - x)$

Hyperbolic functions: $\cosh x = \frac{1}{2}(e^x + e^{-x})$ $\quad \sinh x = \frac{1}{2}(e^x - e^{-x})$ $\quad (\cosh x)^2 - (\sinh x)^2 = 1$

$\cosh(x \pm y) = \cosh x \cosh y \pm \sinh x \sinh y$ $\quad \sinh(x \pm y) = \sinh x \cosh y \mp \cosh x \sinh y$

$\cosh x\ \cosh y = \frac{1}{2}[\cosh(x+y) + \cosh(x-y)]$ $\quad \sinh x\ \sinh y = \frac{1}{2}[\cosh(x+y) - \cosh(x-y)]$

$\sinh x\ \cosh y = \frac{1}{2}[\sinh(x+y) + \sinh(x-y)]$ $\quad (\cosh x)^2 = \frac{1}{2}[\cosh(2x) + 1]$ $\quad (\sinh x)^2 = \frac{1}{2}[\cosh(2x) - 1]$

$\tanh x = \sinh x / \cosh x$ $\quad \coth x = \cosh x / \sinh x$ $\quad \operatorname{sech} x = 1/\cosh x$ $\quad \operatorname{csch} x = 1/\sinh x$

$(\sinh x)' = \cosh x$ $\quad (\cosh x)' = \sinh x$ $\quad (\tanh x)' = (\operatorname{sech} x)^2$

$(\coth x)' = -(\operatorname{csch} x)^2$ $\quad (\operatorname{sech} x)' = -\tanh x \operatorname{sech} x$ $\quad (\operatorname{csch} x)' = -\coth x \operatorname{csch} x$

Trigonometric functions: $\cos x = \frac{1}{2}(e^{ix} + e^{-ix})$ $\quad \sin x = \frac{1}{2i}(e^{ix} - e^{-ix})$ $\quad (\cos x)^2 + (\sin x)^2 = 1$

$\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$ $\quad \sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$

$\cos x\ \cos y = \frac{1}{2}[\cos(x+y) + \cos(x-y)]$ $\quad \sin x\ \sin y = \frac{1}{2}[\cos(x-y) - \cos(x+y)]$

$\sin x\ \cos y = \frac{1}{2}[\sin(x+y) + \sin(x-y)]$ $\quad (\cos x)^2 = \frac{1}{2}[1 + \cos(2x)]$ $\quad (\sin x)^2 = \frac{1}{2}[1 - \cos(2x)]$

$\tan x = \sin x / \cos x$ $\quad \cot x = \cos x / \sin x$ $\quad \sec x = 1/\cos x$ $\quad \csc x = 1/\sin x$

$(\sin x)' = \cos x$ $\quad (\cos x)' = -\sin x$ $\quad (\tan x)' = (\sec x)^2$

$(\cot x)' = -(\csc x)^2$ $\quad (\sec x)' = \tan x \sec x$ $\quad (\csc x)' = -\cot x \csc x$

$\int \sec x\,dx = \ln|\sec u + \tan u|$ $\quad \int \csc x\,dx = -\ln|\csc u + \cot u|$

$\int \frac{dx}{\sqrt{a^2+x^2}} = \sinh^{-1}\left(\frac{x}{a}\right)$ $(a > 0)$ $\quad \int \frac{dx}{\sqrt{a^2-x^2}} = \sin^{-1}\left(\frac{x}{a}\right)$ $\quad \int \frac{dx}{\sqrt{x^2-a^2}} = \cosh^{-1}\left(\frac{x}{a}\right)$ $(x > a > 0)$

$\int \frac{dx}{x\sqrt{a^2+x^2}} = -\frac{1}{a}\operatorname{csch}^{-1}\left|\frac{x}{a}\right|$ $(a > 0, x \neq 0)$ $\quad \int \frac{dx}{x\sqrt{a^2-x^2}} = -\frac{1}{a}\operatorname{sech}^{-1}\left(\frac{x}{a}\right)$ $(0 < x < a)$

$\int \frac{dx}{x\sqrt{x^2-a^2}} = \frac{1}{a}\sec^{-1}\left(\frac{x}{a}\right)$ $\quad \int \frac{dx}{a^2+x^2} = -\frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right)$