Rule #0 (power rule) For $n \in \mathbf{R}_{\neq -1}$, we have

$$\int x^n \,\mathrm{d}x = \frac{1}{n+1} x^{n+1} + C$$

is valid on any interval on which $x \mapsto x^n$ is defined.

Rule #1 (reciprocal rule) On any interval that does not contain zero, we have

$$\int \frac{1}{x} \,\mathrm{d}x = \ln(|x|) + C$$

Rule #2 (outative) For all $a \in \mathbf{R}$ and for any function F that have an antiderivative on an interval I, we have

$$\int aF(x)\,\mathrm{d}x = a \int F(x)\,\mathrm{d}x$$

on the interval I.

Rule #3 (additive) For all $a \in \mathbf{R}$ and for two functions F and G that have an antiderivative on an interval I, we have

$$\int F(x) + G(x)\,\mathrm{d}x = \int F(x)\,\mathrm{d}x + \int G(x)\,\mathrm{d}x$$

on the interval I.

Rule #4 (linear) For all $a, b \in \mathbf{R}$ and for two functions F and G that have an antiderivative on an interval I, we have

$$\int aF(x) + bG(x)\,\mathrm{d}x = a\int F(x)\,\mathrm{d}x + b\int G(x)\,\mathrm{d}x$$

This rule is a combination of the outative rule (Rule 2) and the additive rule (Rule 3). on the interval I.

Rule #5 (special cases) For all $a \in \mathbf{R}_{\neq 0}$, for the interval $\mathbf{R}$, we have

$$\begin{aligned}
\int \cos(ax)\,\mathrm{d}x &= \frac{1}{a}\sin(ax) + C,\\
\int \sin(ax)\,\mathrm{d}x &= -\frac{1}{a}\cos(ax) + C,\\
\int \mathrm{e}^{ax}\,\mathrm{d}x &= \frac{1}{a}\mathrm{e}^{ax} + C.
\end{aligned}$$