$$\int\limits_a^b f(x)\,\mathrm{d}x = \lim S = \lim_{n \to \infty} \sum_{i=1}^n f(x_i^*)\Delta x_i$$

The area lies under the curve and between two vertical lines $x = a$ and $x = b$ is equal to $\int\limits_a^b f(x)\,\mathrm{d}x$ and be approximate

$$S = \sum_{i=1}^n f(x_i^*)\Delta x_i.$$

$\Delta x_i = x_i - x_{i-1}$