

Fundamental Theorem of Calculus: $\int_{x=a}^{x=b} du = u|_{x=a}^{x=b}$.

The notation $u|_{x=a}^{x=b}$ means (u at $x = b$) minus (u at $x = a$).

Differentiating	Antidifferentiating	Integrating
$d(u + v) = du + dv$	$du + dv = d(u + v)$	$\int_{x=a}^{x=b} (du + dv) = \int_{x=a}^{x=b} du + \int_{x=a}^{x=b} dv$
$d(ku) = k du$	$k du = d(ku)$	$\int_{x=a}^{x=b} k du = k \cdot \int_{x=a}^{x=b} du$
$d(u^k) = ku^{k-1} du$	$u^k du = d\left(\frac{u^{k+1}}{k+1}\right)$	$\int_{x=a}^{x=b} u^k du = \frac{u^{k+1}}{k+1} \Big _{x=a}^{x=b}$
$d(\ln u) = du/u$	$du/u = d(\ln u)$	$\int_{x=a}^{x=b} u^{-1} du = \int_{x=a}^{x=b} \frac{du}{u} = (\ln u) \Big _{x=a}^{x=b}$
$d(e^u) = e^u du$	$e^u du = d(e^u)$	$\int_{x=a}^{x=b} e^u du = (e^u) \Big _{x=a}^{x=b}$
$d(uv) = u dv + v du$	$u dv = d(uv) - v du$	$\int_{x=a}^{x=b} u dv = (uv) \Big _{x=a}^{x=b} - \int_{x=a}^{x=b} v du$

In the above, k must be a constant.

If $u \geq 0$, then $|u| = u$. If $u \leq 0$, then $|u| = -u$.