變數變換法

$$\int f(g(x)) \cdot g'(x)\,dx$$

令 $g(x) = u$

$dg(x) = du$

$g'(x)\,dx = du$

→ 函數 $y = f(x)$ 的微分 $df(x) = f'(x)\,dx$

$$= \int f(u)\,du$$

例 1：$\int (x+1)^{10}\,dx$

令 $x+1 = u$

$d(x+1) = du$

$(x+1)'\,dx = du$

$dx = du$

$$\therefore \int (x+1)^{10}\,dx$$

$$= \int u^{10}\,du$$

$$= \frac{u^{10+1}}{10+1} + C$$

$$= \frac{u^{11}}{11} + C$$

$$= \frac{(x+1)^{11}}{11} + C \quad \#$$