

Integration by Substitution

chain rule: $[F(g(x))]^i = F'(g(x)) \cdot g'(x)$

integrate: $F(g(x)) = \int F'(g(x)) \cdot g'(x) dx$

let: $u = g(x)$

$$\frac{du}{dx} = g'(x) \Rightarrow du = g'(x) dx$$

substitute:

$$F(g(x)) = \int F'(u) \cdot du$$

Use when:

$$\int F'(g(x)) \cdot g'(x) dx$$

some part
of the
function

the derivative
of that function.