

Important Formulas

1) Average Value = $\frac{1}{b-a} \int_a^b f(x) dx$

2) Fundamental theorem of Calculus = $\frac{d}{dx} \int_{\text{Constant}}^{\text{function}} f(t) dt$

differentiation Cancels the integration and subs the variable with the function with multiplying and by the derivative of the function.

ex: $\frac{d}{dx} \int_1^x \cos t dt$

$$2x \cos x^2$$

Substitution Method

1) $\int f(x) dx = \int f(u) \frac{du}{dx} dx = \int f(u) du + C$ $\frac{du}{dx}$ = disturbance Method + C

2) $\int (derivative)^n (function) = \frac{function^{n+1}}{n+1} + C$

3) $\int (derivative \text{ of the angle}) (trigonometric function) = \int trigonometric function + C$

4) $\int (Not \text{ a derivative})^n (function) = \text{Substitution Method} + C$

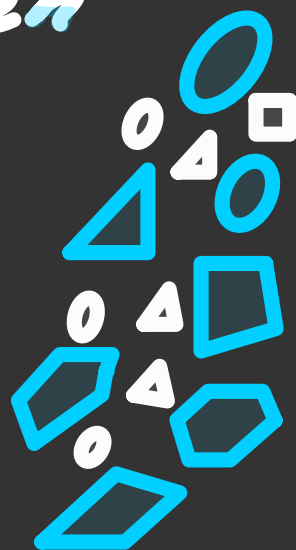
5) $\int \frac{derivative \text{ of the root}}{\sqrt{function}} = 2\sqrt{function} + C$

6) $\int \frac{f(x)}{f'(x)} = \ln|f(x)| + C$

Area between Curves

if $y = \therefore A = \int_a^b [y_1 - y_2] dx$

if $x = \therefore A = \int_c^d [x_1 - x_2] dy$



cos
sec

even

odd

Sin
csc
tan
cot

**symmetric
around**

Y-Axis

the Origin

