1 Definition of Integral

An integral of a function is the anti-derivative of it.

$$\int f(x)dx = F(x) + C \tag{1}$$

Caution If the integral is indefinite **(No specific bounds)** then write down the letter C.

1.1 Properties of the Integral

$$\int kf(x)dx = k\int f(x)dx \tag{2}$$

where k is any constant.

$$\int -f(x)dx = -\int f(x)dx \tag{3}$$

$$\int f(x) \pm g(x)dx = \int f(x)dx \pm \int g(x)dx \tag{4}$$

$$\int adx = ax + C \tag{5}$$

where a is a constant

$$\int x^n = \frac{x^{n+1}}{n+1} \tag{6}$$

1.2 Properties of Definite Integrals

Definite Integrals means an integral with a certain bounds. Written as $\int_a^b f(x)dx$ where f(x) represents a certain function and b and a represents the boundary areas.

$$\int_a^b f(x)dx = -\int_b^a f(x)dx \tag{7}$$

$$\int_a^a f(x)dx = 0 \tag{8}$$

$$\int_a^b f(x)dx \pm \int_b^c f(x)dx = \int_a^c f(x)dx \tag{9}$$

where a, b, and c represents a boundary point.

2 Integration by Substitution

3 Trigonometry Integrals

- $\int sin(x)dx = -cos(x) + C$

- $\int cos(x)dx = sin(x) + C$
- $\int sec^2(x)dx = tan(x) + C$
- $\int csc^2(x)dx = cot(x) + C$
- $\int sec(x)tan(x)dx = sec(x) + C$
- $\int csc(x)cot(x)dx = -csc(x) + C$