§Lecture: 03-09-14 Professor Shabanskaya Calculus 1760-002

Table of indefinate Integrals

17.) $\int \sin(ax)\,dx = -1/a \cos(ax) + C$

18.) $\int \cos(bx)\,dx = 1/b \sin(bx) + C$

Ex.① Find $\int (\cos 3x + \sin 4x)\,dx = \int \cos 3x\,dx + \int \sin 4x\,dx =$

$\int 1/3 \sin 3x + (-1/4 \sin 4x) + C = 1/3 \sin 3x - 1/4 \cos 4x + C$

$= \boxed{1/3 \sin 3x - 1/4 \cos 4x + C}$

Chapter 6: Intergration

Section 6.1: The Definate Intergral

Definition: Let $a_1, a_2, a_3, \ldots, a_n$ be real numbers (n is a positive intergor. Then $\sum_{i=1}^{n} a_i = a_1 + a_2 + a_3 + a_4 + \cdots + a_n$

where $\sum_{i=1}^{n} a_i$ means the summation of a_i's from $i=1$ to $i=n$

Ex: ① p. 291 #11 Write $\sum_{k=0}^{3} (-1)^{k+1}$ in expanded form.

Solution: $\sum_{k=0}^{3} (-1)^{k+1} = (-1)^{0+1} + (-1)^{1+1} + (-1)^{2+1} + (-1)^{3+1}$

$= -1 + 1 + -1 + 1 = 0$

② Express the sum in sigma notation:

$-1/10 + 1/11 - 1/12 + 1/13 - 1/14$

Solution: $-1/10 + 1/11 - 1/12 + 1/13 - 1/14 =$

$\sum_{k=10}^{14} (-1)^{?\,k-1}\, 1/k = -1/10 + \frac{1}{11}$

Properties of the summation (Σ)

E.)

1.) $\sum_{i=0}^{n} (a_i + b_i) = \sum_{i=0}^{n} + \sum_{i=0}^{n} b_i$, because $(a_0 + b_0) + (a_1 + b_1) + (a_2 + b_2) + \cdots + (a_n + b_n) =$
$(a_0 + a_1 + a_2 + \cdots + a_n) + (b_0 + b_1 + b_2 + \cdots + b_n) =$
$\sum_{i=0}^{n} a_i + \sum_{i=0}^{n} b_i$