

**Dr.SNS RAJALAKSHMI COLLEGE OF ARTS AND SCIENCE
(Autonomous)**

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Coimbatore- 49**



DEPARTMENT OF MATHEMATICS

**21UCR304: BUSINESS CALCULUS AND FINANCIAL
COMPUTATION**

Determining Infinite Integrals of simple functions

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- Integration = Reverse process of differentiation
- Two types:
 - ✓ Indefinite Integrals
 - ✓ Definite Integrals
- Used for:
 - Area under curves
 - Accumulation problems
 - Physics & engineering applications

- General form:

$$\int f(x) dx = F(x) + C$$

- C = Constant of Integration
- Represents a family of functions

$$1. \int k dx = kx + C$$

$$2. \int x^n dx = \frac{x^{n+1}}{n+1} + C, n \neq -1$$

$$3. \int \frac{1}{x} dx = \ln|x| + C$$

$$4. \int e^x dx = e^x + C$$

$$5. \int \sin x dx = -\cos x + C$$

$$6. \int \cos x dx = \sin x + C$$

- $\int a^x dx = \frac{a^x}{\ln a} + C$
- $\int \sec^2 x dx = \tan x + C$
- $\int \csc^2 x dx = -\cot x + C$

- Linearity:

$$\int (af(x) + bg(x))dx = a \int f(x)dx + b \int g(x)dx$$

- Add or subtract inside integrals

$$\int (4x^3 + 6x + 2) dx$$

Solution:

$$= x^4 + 3x^2 + 2x + C$$

$$\int (5e^x - 3 \sin x) dx$$

Solution:

$$5e^x + 3 \cos x + C$$

- Finding original function from derivative
- Physics (velocity \rightarrow displacement)
- Population growth models
- Economics (marginal cost \rightarrow total cost)

THANK YOU