INTEGRATION

Note Title 5/15/2018

- THE PROCESS OF "ANTI-DIFFERENTIATION" IS CALLED INTEGRATION

IE $\int x^2 \, dx = \frac{1}{3}x^3 + C$

x^2: INTEGRAND

dx: WITH RESPECT TO x

C: CONSTANT OF INTEGRATION

Basic Formulas of Integration

1) $\int c\,dx = cx + d$

2) $\int x^r\,dx = \frac{x^{r+1}}{r+1} + C$

3) $\int \frac{1}{x}\,dx = \ln x + c$

4) $\int b e^{ax}\,dx = \frac{b}{a} e^{ax} + c$

5) $\int K \cdot f(x)\,dx = K \int f(x)\,dx$

$= K \cdot F(x)$

6) $\int (f(x) \pm g(x))\,dx = \int f(x)\,dx \pm \int g(x)\,dx$

$= F(x) \pm G(x)$

IE $\int 6x^2 + 7x + \frac{9}{x}\ dx$

SOLN $= \int 6x^2\,dx + \int 7x\,dx + \int \frac{9}{x}\,dx$

$= 6\int x^2\,dx + 7\int x\,dx + 9\int \frac{1}{x}\,dx$

$= 6 \cdot \frac{x^3}{3} + 7 \cdot \frac{x^2}{2} + 9 \cdot \ln x + C$

$= 2x^3 + \frac{7}{2}x^2 + 9\ln x + C$

Ex $\int \sqrt[3]{x^2} + 3e^{5x}\, dx$

Soln $= \int \sqrt[3]{x^2}\, dx + \int 3e^{5x}\, dx$

$= \int x^{\frac{2}{3}}\, dx + \int 3e^{5x}\, dx$

$= \frac{x^{\frac{5}{3}}}{\frac{5}{3}} + \frac{3e^{5x}}{5} + C$

$= \frac{3}{5} x^{5/3} + \frac{3}{5} e^{5x} + C$

H/W

Pg. 347

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