Actividad Fundamental #2

2127816
28 | 04 | 23

ILATE

(2) $\int \underset{A}{x} \cdot \underset{E}{e^{2x}}\, dx$ $\quad u = x \quad dv = e^{2x}$

$du = dx$

$v = \frac{e^{2x}}{2}$

$= x\frac{e^{2x}}{2} - \frac{1}{2}\int e^{2x}\, dx$

$= \frac{xe^{2x}}{2} - \frac{e^{2x}}{4} + C$

$\boxed{= \frac{xe^{2x}}{2} - \frac{e^{2x}}{4} + C}$

(2) $\int \underset{A}{t^2} \underset{T}{\cos} t\, dt$ $\quad u = t^2 \quad dv = \cos t$

$du = 2t\, dx$

$v = \sin(t)$

$= t^2 \operatorname{sen} t - \int \operatorname{sen} t\, 2t\, dt$

$= t^2 \operatorname{sen} t - 2\int \operatorname{sen}(t)\, t\, dt$

$= t^2 \operatorname{sen} t - 2\left(t(-\cos t) - \int -\cos t\, dt\right)$

$= t^2 \operatorname{sen}(t) - 2\left(t(-\cos t) + \sin(t)\right)$

$\boxed{= t^2 \operatorname{sen} t + 2t\cos t - 2\operatorname{sen} t + C}$

(3) $\int \underset{A}{x^7} \underset{L}{\ln 5x}\, dx$ $\quad u = \ln 5x \quad dv = x^7$

$= \int \ln(5) x^7\, dx + \int x^7 \ln(x)\, dx$

$= \left[\frac{\ln(5)x^8}{8}\right] + \left[\frac{\ln(x)x^8}{8} - \frac{x^8}{64}\right]$

$= \frac{\ln(5)x^8 + \ln(x)x^8}{8} - \frac{x^8}{64} + C$

ILATE

$$\int \underbrace{e^{y}}_{dv} \underbrace{\cos(y)}_{v}\, dy$$

E T

$= \cos y\, e^{y} - \int e^{y} \cdot -\operatorname{sen} y\, dy$

$= \cos y\, e^{y} + \int \operatorname{sen} y\, e^{y}\, dy$

$= \cos y\, e^{y} \operatorname{sen} y\, e^{y} - \int e^{y} \cos y\, dy$

$= 2\left[\cos y\, e^{y}\right] + e^{y}\left[\operatorname{sen} y\, e^{y}\right)$

$= \dfrac{\cos y\, e^{y} + \operatorname{sen} y\, e^{y}}{2}$

Actividad Fundamental #8

Ejercicio para los alumnos

① $\int \cos^5(x)\,dx$

$\int \cos^4(x)\cos(x)\,dx$

$\int 1-2u^2+u^4\,du$

$\int 1\,du - \int 2u^2\,du + \int u^4\,du$

$u - \frac{2u^3}{3} + \frac{u^5}{5}$

$\sin x - \frac{2\sin x^3}{3} + \frac{\sin x^5}{5} + C$

② $\int \text{sen}^2(5x)\cos^3(5x)\,dx$

$\int \frac{u^2-u^{3+1}}{5}$ $\frac{1}{5}\int u^2-u^4\,du$ $\frac{1}{5}\left(\int u^2\,du - \int u^4\,du\right)$

$\frac{1}{5}\left(\frac{u^3}{3} - \frac{u^5}{5}\right)$ $\frac{1}{5}\left(\frac{\text{sen}(5x)^3}{3} - \frac{\text{sen}(5x)^5}{5}\right)$

$= \frac{\text{sen}(5x)^3}{15} - \frac{\text{sen}(5x)^5}{25}$

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③ $\int sen^5(x)\, cos^3(x)\, dx$

$\int u^3 - u^7\, du \quad \frac{u^6}{6} - \int u^7\, du \quad \frac{u^6}{6} - \frac{u^8}{8}$

$\frac{sen(x)^6}{6} - \frac{sen(x)^8}{8} + C$ //

④ $\int sen^3(x)\, cos^3(x)\, dx$

$\int u^3 - u^5\, du = \int u^3\, du - \int u^5\, du$

$\frac{u^4}{4} - \frac{u^6}{6}$

$\frac{sin(x)^4}{4} - \frac{sin(x)^6}{6} + C$ //

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