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MATEMÁTICA II
2° AÑO – PRIMER CUATRIMESTRE

UNIDAD N° 2 - Práctico N° 2

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Un poco desprolijo, pero ...
bien hecho

Cálculo de Integrales indefinidas

Calcular:

1. $\int (x^2-1)^2 . dx$
2. $\int (3-t^2) . \sqrt{t} . dt$
3. $\int \frac{2x^3-7x^2-4}{x^2} . dx$
4. $\int \frac{x+1}{\sqrt{x}} . dx$
5. $\int (t^2 - \operatorname{sen} t) . dt$

$$③\ \int \frac{2x^3-7x^2-4}{x^2}\cdot dx = \int \frac{2x^3}{x^2}-\frac{7x^2}{x^2}-\frac{4}{x^2}\cdot dx =$$

$$= 2\int \frac{x^3}{x^2}\cdot dx - 7\int \frac{x^2}{x^2}\,dx - 4\int \frac{dx}{x^2}$$

$$= \left(\frac{2}{x^2}\cdot\frac{x^4}{4}\right) - \frac{7}{x^2}\cdot\frac{x^3}{3} - \frac{4x}{x^2}$$

$$\frac{2x^4}{4x^2} - \frac{7x^3}{3x^2} - \frac{4x}{x^2} =$$

$$\frac{x^2}{2} - \frac{7}{3}x - \frac{4}{x}$$

$$③\ \int\left(\frac{2x^3-7x^2-4}{x^2}\right)\cdot dx = \int\left(2x-7-\frac{4}{x^2}\right)\cdot dx = 2\int x\cdot dx - 7\int dx - 4\int\frac{1}{x^2} =$$

$$= \frac{2x^2}{2} - 7x - \frac{4}{x}$$

$$①\ \int (x^2-1)^2\cdot dx = \int\left(x^4+2\cdot x^2\cdot(-1)+(-1)^2\right)\cdot dx =$$

$$x^4-2x^2+1$$

$$= \int x^4\cdot dx - 2\int x^2\cdot dx + 1\int dx =$$

$$= \frac{x^5}{5} - \frac{2x^3}{3} + 1x + C$$

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② $\int (3-t^2)\cdot\sqrt{t}\cdot \overset{dt}{\cancel{dx}} = \int \left(3\sqrt{t} - t^2\sqrt{t}\right)\cdot dt$

$$\frac{1}{2}+\frac{1}{2}=\frac{2+2x^2}{\cancel{2}}$$

$= 3\cdot t^{1/2} - t^2\cdot t^{1/2} =$

$\frac{1}{1}+\frac{1}{2}=\frac{2+1}{2}$

$3t^{1/2} - t^{5/2} =$

$\frac{5}{2}+1=\frac{5}{2}+\frac{2}{2}=\frac{7}{2}$

$3\int t^{1/2}\cdot dx - \int t^{5/2}$

$\frac{2}{1}+\frac{1}{2}=\frac{3}{2}$

$$\frac{t^{3/2}}{\frac{3}{2}} \qquad \frac{t^{7/2}}{\frac{7}{2}}$$

$\frac{1}{2}+\frac{2}{2}=\frac{3}{2}$

$2+\frac{1}{2}=\frac{4}{2}+\frac{1}{2}$

$$\frac{\cancel{6}2\, t^{3/2}}{\cancel{3}} - \frac{2t^{7/2}}{7} = 2t^{3/2} - \frac{2t^{7/2}}{7} + C \quad \checkmark \quad \int$$

d?

$2\cdot 8 = \frac{\cancel{16}}{\cancel{2}}\cdot 2$

④ $\int \frac{x+1}{\sqrt{x}}\cdot dx = \frac{x+1}{x^{1/2}} = \frac{x}{x^{1/2}} + \frac{1}{x^{1/2}} = \frac{2x^2}{\frac{x^{3/2}}{3}} = \frac{2x^2}{\frac{x^{3/2}}{3}}$

$x^{1/2} + \frac{1}{x^{1/2}}$

$\frac{x+1}{\sqrt{x}} = x + 1x^{-1/2} = \int x + 1\int x^{-1/2}$

$1-\frac{1}{2}=\frac{2+1}{2}$

$= \frac{x^2}{2} + 1\cdot\frac{x^{1/2}}{\frac{1}{2}} = \frac{x^2}{2} + 2\left(x^{1/2}\right) + C$

$\int x^{1/2}$

$\frac{x^{3/2}}{\frac{3}{2}} + \frac{x^{1/2}}{\frac{1}{2}} = \frac{2x^{3/2}}{3} + 2x^{1/2}$ ✓ ✓

$(x+1)\cdot x^{-1/2}$

$x^{1/2} + 1x^{-1/2}$

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(5) $\int (t^2 - \text{sen}\, t) \cdot dx = \int t^2 \cdot dt - \int \text{sen}\, t \cdot dt =$

$= \dfrac{t^3}{3} + \cos t$ ✓

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