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BIBLIOGRAFIA:

EXAMEN FINAL

1. $$\int \operatorname{sen}^{-1} 3x^2\,dx = \frac{\sqrt{1-(3)^2(x^2)^2}}{3} + x^2 \sin^{-1}(3x^2) + C$$

$$= \frac{\sqrt{1-9x^4}}{3} + \frac{x^2}{\operatorname{sen} 3x^2}$$

$$= \sqrt{1/3 - 3x^4} + \frac{x^2}{\operatorname{sen} 3x^2} + C$$

2. $$\int \cos^{-1} 5x\,dx = x\cos^{-1}(5x) - \frac{\sqrt{1-(5)^2(x)^2}}{5} + C$$

$$= \frac{x}{\cos 5x} - \frac{\sqrt{1-25x^2}}{5} + C$$

$$= \frac{x}{\cos 5x} - \sqrt{1/5 - 25}\,x^2 + C$$

3. $$\int \tan^{-1} 1/x^2\,dx = x^2 \tan^{-1}(1/x^2) - \frac{\ln|(1)^2(x^2)^2+1}{2(1)} + C$$

$$\frac{x^2}{\tan 1/x^2} - \frac{\ln|1x^4+1}{2} + C$$

4. $\cos^3 2x/3 \, dx = \cos 2x/3 \times \cos^2 2/3 x \rightarrow \operatorname{sen}^2 x + \cos^2 x = 1$

$\cos^2 x = 1 - \operatorname{sen}^2 x$

$= \cos 2/3 x \, (1 - \operatorname{sen}^2 2/3 x)\, dx$

$= \cos 2/3 x \, dx - \int \operatorname{sen}^2 2/3 x \cos 2/3 x \, dx \rightarrow \int \cos v \, dv = \operatorname{sen} v$

$= 2/3 \int \cos 2/3 \, (2\,dx) - 2/3 \int \operatorname{sen}^2 2/3 x \cos 2/3 x \; 2dx \rightarrow v^n dv = \dfrac{v^n + 1}{n + 1}$

$v = \operatorname{sen} 2x$

$dv = \cos 2/3 x \; 2\,dx$

$= 2/3 \operatorname{sen} 2x - 2/3 \dfrac{\operatorname{sen}^3 2x}{3} + C$

5. $\sec^4 2x \, dx = \int \sec^2 v \, dv = \tan^2 v + 1$

$= \sec^2 2x \sec^2 2x \, dx$

$= \int (\tan^2 2x + 1) \sec^2 2x \, dx$

$= \underbrace{\int \tan^2 2x \sec^2 2x \, dx}_{} + \underbrace{\int \sec^2 2x \, dx}_{} \rightarrow \int \sec^2 v \, dv = \tan v$

$v = 2x$

$dv = 2\,dx$

$\dfrac{dv}{2} = dx$

$v^n dv = \dfrac{v^n + 1}{n + 1}$

$v = \tan 2x$

$dv = 2 \sec^2 2x \, dx$

$\dfrac{dv}{2} = \sec^2 2x \, dx$

$= \int v^2 \dfrac{dv}{2} + \int \sec^2 v \dfrac{dv}{2} = 1/2 \int v^2 \, dv + 1/2 \int \sec^2 v \, dv$

$= 1/2 \, (v^3/3) + 1/2 \tan v + C = 1/6 \, v^3 + 1/2 \tan v + C$

$= 1/6 \tan^3 2x + 1/2 \tan 2x + C$

$6.\ \csc^{-1} 2x^2\,dx = \dfrac{\ln\left|2\sqrt{(2)^2(x^2)^2-1}+(2x^2)\right|}{2} + x^2\csc^{-1}(2x^2)+C$

$$\frac{\ln\left|2\sqrt{4x^4-1}+\cancel{2}x^2\right|}{\cancel{2}} + \frac{x^2}{\csc 2x^2} + C$$

$$\ln\left|2\sqrt{2x^4-1}+x^2\right| + \frac{x^2}{\csc 2x^2} + C$$

$7.\ \cot^{-1}\sqrt{2x}\,dx = \dfrac{\ln\left|(\sqrt{2})^2(x)^2+1\right|}{2(\sqrt{2})} + x\cot^{-1}(\sqrt{2}x)+C$

$$= \frac{\ln|2x^2+1|}{2.82} + \frac{x}{\cot\sqrt{2}x} + C$$

$8.\ \int \operatorname{sen}^{-1}\sqrt{2}\,x^2\,dx = \dfrac{\sqrt{1-(\sqrt{2})^2(x^2)^2}}{\sqrt{2}} + x^2\operatorname{sen}^{-1}(\sqrt{2}x^2)+C$

$$\frac{\sqrt{1-2x^4}}{1.41} + \frac{x^2}{\operatorname{sen}\sqrt{2}x^2} + C$$

$9.\ \int \operatorname{senh} 1/x^2\ dx$

$y = \operatorname{senh}^{-1}(x/2) + x\dfrac{1/2}{\sqrt{1+(x/2)^2}} = \dfrac{2x}{2\sqrt{6x^2}} = \operatorname{senh}(x/2)$

$+\dfrac{x}{\sqrt{6x^2}} - \dfrac{x}{\sqrt{6x^2}} = \operatorname{senh}^{-1}\left(\dfrac{x}{2}\right)$

16. $\int senh^2 x \, dx = \int \left(\frac{e^x - e^{-x}}{2} \right) dx$

$= \int \left(\frac{e^x - e^{-x}}{4} \right)^2 dx = 1/4 \int (e^x)^2 - 2 + (e^{-x})^2 \, dx$

$= 1/4 \int e^{2x} - 2 + e^{-2x} \, dx$

$= 1/4 \left(1/2 \, e^{2x} - 2x - 1/2 \, e^{-2x} \right) + C$

$= -1/2 \, x + 1/4 \left(\frac{e^{2x} - e^{-2x}}{2} \right) + C$