$\int \frac{1}{x^2-x-2}\,dx \qquad x^2-x-2=0 \quad x=\frac{1\pm 3}{2}\begin{matrix}2\\-1\end{matrix}$

$\frac{1}{(x-2)(x+1)}=\frac{A}{x-2}+\frac{B}{x+1}$

$1=A(x+1)+B(x-2)$

$x=-1 \quad 1=-3B \quad B=-\frac{1}{3}$

$x=2 \quad 1=3A \quad A=\frac{1}{3}$

$\int \frac{\frac{1}{3}}{x-2}\,dx+\int \frac{-\frac{1}{3}}{x+1}\,dx=\frac{1}{3}\ln|x-2|-\frac{1}{3}\ln|x+1|+C$

$\frac{1}{3}\left[\ln(x-2)-\ln(x+1)\right]+C=\frac{1}{3}\ln\left|\frac{x-2}{x+1}\right|+C$

$\ln\sqrt[3]{\frac{x-2}{x+1}}+C$

mar 22-13:07

$\int \frac{5x^2}{x^3-3x^2+3x-1}\,dx$

| | 1 | −3 | 3 | −1 |
|---|---|---|---|---|
| 1 | 1 | 1 | −2 | 1 |
| | 1 | −2 | 1 | 0 |

$x=\frac{2\pm 0}{2}=1$ (doble)

$\frac{5x^2}{(x-1)^3}=\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{C}{(x-1)^3}$

$5x^2=A(x-1)^2+B(x-1)+C$

$x=1 \quad 5=C$

$x=0 \quad 0=A-B+C \quad A-B=-5$

$x=2 \quad 20=A+B+C \quad A+B=15$

$2A=10 \quad A=5$

$B=10$

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$\int \frac{5}{x-1}\,dx+\int \frac{10}{(x-1)^2}\,dx+\int \frac{5}{(x-1)^3}\,dx$

Log Potencias

$5\ln|x-1|+10\frac{(x-1)^{-1}}{-1}+5\frac{(x-1)^{-2}}{-2}+C$

$5\ln|x-1|-\frac{10}{x-1}-\frac{5}{2(x-1)^2}+C$

mar 22-13:13

$\int \frac{1}{1+4x^2}\,dx=\frac{1}{2}\int \frac{2}{1+(2x)^2}\,dx$

$\frac{1}{2}\arctg(2x)+C$

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$\int \frac{1}{x^2+2x+2}\,dx \qquad x=\frac{-2\pm\sqrt{4-8}}{2}$ ∄

log + arctg.

$\int \frac{f'(x)}{1+[f(x)]^2}\,dx$

$\int \frac{1}{(x+1)^2+1}\,dx = \operatorname{arctg}|x+1|+c$

$x^2+2x+1$

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$\int \frac{3x+1}{x^2+3x+3}\,dx \qquad x=\frac{-3\pm\sqrt{9-12}}{2}$ ∄

log + arctg

$\frac{3}{2}\int \frac{3(3x+1)}{x^2+3x+3}\,dx = \frac{3}{2}\int \frac{2x+2}{x^2+3x+3}\,dx$

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

$\frac{3}{2}\int \frac{-7/3}{x^2+3x+3}\,dx$

$\frac{3}{2}\ln|x^2+3x+3| - \frac{7}{2}\int \frac{1}{x^2+3x+3}\,dx$

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$\int \frac{1}{x^2+3x+3}\,dx = \int \frac{1}{(x+\frac{3}{2})^2+\frac{3}{4}}\,dx$

$x^2+3x+\frac{9}{4}$

$3x = 2x$ □

$\frac{1}{3/4}\int \frac{1}{\frac{(x+\frac{3}{2})^2}{3/4}+\frac{3}{4}}\,dx \qquad \frac{\sqrt{3}}{2}\cdot\frac{4}{3}\int \frac{1}{\left(\frac{2x+3}{\sqrt{3}}\right)^2+1}\,\frac{2}{\sqrt{3}}$

$\frac{2\sqrt{3}}{3}\operatorname{arctg}\left(\frac{2x+3}{\sqrt{3}}\right)$

Sol $\frac{3}{2}\ln|x^2+3x+3| - \frac{7}{2}\cdot\frac{2\sqrt{3}}{3}\operatorname{arctg}\left(\frac{2x+3}{\sqrt{3}}\right)+c$ □

$\frac{3}{2}\ln|x^2+3x+3| - \frac{7\sqrt{3}}{3}\operatorname{arctg}\left(\frac{2x+3}{\sqrt{3}}\right)+c$

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Deberes: Autoevaluación

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