



LISTA DE EXERCÍCIOS SOBRE INTEGRAÇÃO DE FUNÇÕES RACIONAIS

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Disciplina: Cálculo II (LOB1004)

Departamento de Ciências Básicas e Ambientais

Exercícios propostos

$$4.19 \int \frac{x^2+4x-2}{x^3-4x} dx$$

$$4.20 \int \frac{xdx}{x^2-3x+2}$$

$$4.21 \int \frac{5x+3}{x^2-7x+12} dx$$

$$4.22 \int \frac{x^2-2x+3}{x^2-3x+2} dx$$

$$4.23 \int \frac{x^2+1}{(x-1)(x+1)} dx$$

$$4.24 \int \frac{x^3 dx}{(x^2-1)(x+2)}$$

$$4.25 \int \frac{xdx}{x^4-1}$$

$$4.26 \int \frac{dx}{x^2(x-1)}$$

$$4.27 \int \frac{dx}{(1-x^2)^2}$$

$$4.28 \int \frac{3x^3+5}{(x+1)^2-13x+27} dx$$

$$4.29 \int \frac{x^2+2}{x^4+4} dx$$

$$4.30 \int \frac{x^3+2}{x^2+1} dx$$

$$4.31 \int \frac{x^3+x-1}{2x^2(x^2+1)} dx$$

$$4.32 \int \frac{dx}{x^4-1}$$

$$4.33 \int \frac{x^2 dx}{(x^2+a^2)(x+a)^2} \quad (a > 0)$$

$$4.34 \int \frac{dx}{(x-1)^2(x^2+x+1)}$$

$$4.35 \int \frac{x^3 dx}{x^4+x^2+1}$$

$$4.36 \int \frac{3x^2+1}{(x^2+1)^3} dx$$

Respostas dos exercícios

$$4.19 \frac{1}{2} \ln|x| - \frac{3}{4} \ln|x+2| + \frac{5}{4} \ln|x-2| \quad 4.20 -\ln|x-1| + 2 \ln|x-2|$$

$$4.21 23\ln|x-4| - 18\ln|x-3| \quad 4.22 x+3\ln|x-2| - 2\ln|x-1|$$



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$$4.23 \quad x - 2\ln|x-1| + 5\ln|x-2| \quad 4.24 \quad x + \frac{1}{2}\ln|x+1| + \frac{1}{6}\ln|x-1| - \frac{8}{3}\ln|x+2|$$

$$4.25 \quad \frac{1}{4}\ln|x-1| + \frac{1}{4}\ln|x+1| - \frac{1}{4}\ln(x^2+1) \quad 4.26 \quad \frac{1}{x} + \ln|x-1| - \ln|x|$$

$$4.27 \quad \frac{x}{2(1-x^2)} + \frac{1}{4}\ln|x+1| - \frac{1}{4}\ln|x-1|$$

$$4.28 \quad \frac{3}{2}x^2 + 33x - 339\ln|x-4| + 618\ln|x-7|$$

$$4.29 \quad \text{Fazer } x^4+4 = (x^2+2)^2-4x^2 ; \frac{1}{2}(\operatorname{arctg}(x-1)+\operatorname{arctg}(x+1))$$

$$4.30 \quad \frac{x^2}{2} + 2\operatorname{arctg} x - \frac{1}{2}\ln(1+x^2) \quad 4.31 \quad \frac{1}{2}(x+\ln|x|+\operatorname{arctg} x)$$

$$4.32 \quad -\frac{1}{4}\ln|x+1| + \frac{1}{4}\ln|x-1| - \frac{1}{2}\operatorname{arctg} x \quad 4.33 \quad -\frac{1}{2(x+a)} - \frac{1}{2a}\ln|x+a| + \frac{1}{4a}\ln(x^2+a^2)$$

$$4.34 \quad -\frac{1}{3}\ln|x-1| - \frac{1}{3(x-1)} + \frac{1}{6}\ln(x^2+x+1) + \frac{1}{3\sqrt{3}}\operatorname{arctg} \frac{2x+1}{\sqrt{3}}$$

$$4.35 \quad \text{Preliminarmente, faça } u = x^2. \quad \frac{1}{4}\ln(x^4+x^2+1) - \frac{\sqrt{3}}{6}\operatorname{arctg} \frac{2x^3+1}{\sqrt{3}}$$

$$4.36 \quad \frac{3}{4}\operatorname{arctg} x + \frac{3x^3+x}{4(1+x^2)^3}$$