



**UNIVERSIDADE FEDERAL DO RIO GRANDE - FURG**  
**INSTITUTO DE MATEMÁTICA, ESTATÍSTICA E FÍSICA - IMEF**  
**01352 - CÁLCULO II – TURMA: U**

**LISTA DE EXERCÍCIOS N° 2**

Resolver as integrais:

1.  $\int (2x^3 - 5x^2 - 3x + 4)dx , \text{ R: } \frac{x^4}{2} - \frac{5x^3}{3} - \frac{3x^2}{2} + 4x + C$
2.  $\int \frac{4x^2 - 2\sqrt{x}}{x} dx , \text{ R: } 2x^2 - 4\sqrt{x} + C$
3.  $\int \frac{xdx}{(a+bx^2)^3} , \text{ R: } -\frac{1}{4b(a+bx^2)^2} + C$
4.  $\int t \sqrt{2t^2 + 3} dt , \text{ R: } \frac{\sqrt{(2t^2 + 3)^3}}{6} + C$
5.  $\int \sqrt{x}(\sqrt{a} - \sqrt{x})^2 dx , \text{ R: } \frac{2a\sqrt{x^3}}{3} - x^2\sqrt{a} + \frac{2\sqrt{x^5}}{5} + C$
6.  $\int \frac{\sec^2 y}{a + btgy} dy , \text{ R: } \frac{1}{b} \ln(a + btgy) + C$
7.  $\int \frac{ae^\theta + b}{ae^\theta - b} d\theta , \text{ R: } 2\ln(ae^\theta - b) - \theta + C$
8.  $\int \left( \frac{\sec x}{1 + \operatorname{tg} x} \right)^2 dx , \text{ R: } -\frac{1}{1 + \operatorname{tg} x} + C$
9.  $\int \left( \frac{\arctg 2x}{1 + 4x^2} + \frac{e^{2x}}{e^{2x} + 4} \right) dx , \text{ R: } \frac{1}{4}(\arctg 2x)^2 + \frac{1}{2}\ln(e^{2x} + 4) + C$
10.  $\int \frac{\cos \sqrt{x} + \sqrt[3]{1 - \sqrt{x}}}{\sqrt{x}} dx , \text{ R: } 2\operatorname{sen} \sqrt{x} - \frac{3}{2}\sqrt[3]{(1 - \sqrt{x})^4} + C$
11.  $\int \left( x^2 e^{x^3} + \frac{\sqrt{1-x}}{3} - \frac{\cos \sec^2 x}{\cot gx} \right) dx , \text{ R: } \frac{e^{x^3}}{3} - \frac{2}{9}\sqrt{(1-x)^3} + \ln(\cot gx) + C$
12.  $\int (\sec 4x - 1)^2 dx , \text{ R: } \frac{1}{4} \operatorname{tg} 4x - \frac{1}{2} \ln(\sec 4x + \operatorname{tg} 4x) + x + C$
13.  $\int \frac{\sqrt{x} + \ln x}{x} dx , \text{ R: } 2\sqrt{x} + \frac{\ln^2 x}{2} + C$
14.  $\int \frac{2\sqrt[3]{x} - \operatorname{sen} \sqrt[3]{x}}{\sqrt[3]{x^2}} dx , \text{ R: } \frac{3 \cdot 2\sqrt[3]{x}}{\ln 2} + 3\cos \sqrt[3]{x} + C$
15.  $\int (\operatorname{tg} \theta + \operatorname{cot} g\theta)^2 d\theta , \text{ R: } \operatorname{tg} \theta - \operatorname{cot} g\theta + C$

16.  $\int \left[ \frac{x \operatorname{arcsen}(x^2)}{\sqrt{1-x^4}} - \frac{\cos(\ln 2x)}{x} \right] dx , \text{ R: } \frac{[\operatorname{arcsen}(x^2)]^2}{4} - \operatorname{sen}(\ln 2x) + C$
17.  $\int \frac{x \sec^2(x^2)}{\sqrt{1-\operatorname{tg}^2(x^2)}} dx , \text{ R: } \frac{1}{2} \operatorname{arcsen}[\operatorname{tg}(x^2)] + C$
18.  $\int \left\{ \frac{1}{x} \sqrt{\frac{\operatorname{arcsec} x}{x^2-1}} - \frac{\cos[\ln(\sec x)]}{\cot gx} \right\} dx , \text{ R: } \frac{2}{3} \sqrt{(\operatorname{arcsec} x)^3} - \operatorname{sen}[\ln(\sec x)] + C$
20.  $\int \frac{x[1+x^2 \ln(1+x^4)]}{1+x^4} dx , \text{ R: } \frac{1}{2} \operatorname{arctg}(x^2) + \frac{1}{8} \ln^2(1+x^4) + C$
21.  $\int \left( \operatorname{tg}x \sec^2 x - \frac{\sqrt{\operatorname{tg}x+1}}{\cos^2 x} \right) dx , \text{ R: } \frac{1}{2} \operatorname{tg}^2 x - \frac{2}{3} \sqrt{(\operatorname{tg}x+1)^3} + C$
22.  $\int \left[ 3^x e^x - \frac{1}{(1+x^2) \operatorname{arctg}x} \right] dx , \text{ R: } \frac{3^x e^x}{1+\ln 3} - \ln(\operatorname{arctg}x) + C$
23.  $\int \frac{(a^x - b^x)^2}{a^x b^x} dx , \text{ R: } \frac{\left(\frac{a}{b}\right)^x - \left(\frac{b}{a}\right)^x}{\ln a - \ln b} - 2x + C$
24.  $\int \frac{\arccos x - x}{\sqrt{1-x^2}} dx , \text{ R: } -\frac{1}{2} (\arccos x)^2 + \sqrt{1-x^2} + C$
25.  $\int \frac{(2x-5)dx}{3x^2-2} , \text{ R: } \frac{1}{3} \ln(3x^2-2) - \frac{5\sqrt{6}}{12} \ln\left(\frac{3x-\sqrt{6}}{3x+\sqrt{6}}\right) + C$
26.  $\int \frac{(2-x)dx}{\sqrt{1-x^2}} , \text{ R: } 2 \operatorname{arcsen}x + \sqrt{1-x^2} + C$
27.  $\int \frac{(x-1)dx}{x^2+25} , \text{ R: } \frac{1}{2} \ln(x^2+25) - \frac{1}{5} \operatorname{arctg}\left(\frac{x}{5}\right) + C$