



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

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