UNIVERSIDADE FEDERAL DO RIO GRANDE - FURG
INSTITUTO DE MATEMÁTICA, ESTATÍSTICA E FÍSICA - IMEF
CÁLCULO DIFERENCIAL E INTEGRAL I
9ª LISTA DE EXERCÍCIOS

Resolver as integrais:

1. $\int \frac{xdx}{\sqrt{27+6x-x^2}}$, R: $-\sqrt{27+6x-x^2}+3arcsen\left(\frac{x-3}{6}\right)+C$

2. $\int \frac{dx}{\sqrt{x(3x+5)}}$, R: $\frac{\sqrt{3}}{3}\ln\left(6x+5+\sqrt{12x(3x+5)}\right)+C$

3. $\int \frac{dx}{3x^2-2x+4}$, R: $\frac{\sqrt{11}}{11}arctg\left(\frac{3x-1}{\sqrt{11}}\right)+C$

4. $\int \frac{(1-x)dx}{4x^2-4x-3}$, R: $-\frac{1}{8}\ln\left(4x^2-4x-3\right)+\frac{1}{16}\ln\left(\frac{2x-3}{2x+1}\right)+C$

5. $\int \sqrt{3x^2+4x-7}\,dx$,

   R: $\frac{1}{6}(3x+2)\sqrt{3x^2+4x-7}-\frac{25\sqrt{3}}{18}\ln\left(3x+2+\sqrt{9x^2+12x-21}\right)+C$

6. $\int \sqrt{2x-x^2}\,dx$, R: $\frac{1}{2}(x-1)\sqrt{2x-x^2}+\frac{1}{2}arcsen(x-1)+C$

7. $\int \frac{(2x-1)dx}{5x^2-x+2}$, R: $\frac{1}{5}\ln\left(5x^2-x+2\right)-\frac{8}{5\sqrt{39}}arctg\left(\frac{10x-1}{\sqrt{39}}\right)+C$

8. $\int \frac{\left(x^5-x^2+8\right)dx}{x^2-4}$, R: $\frac{x^4}{4}+2x^2-x+9\ln(x-2)+7\ln(x+2)+C$

9. $\int \frac{\left(x^4-x^3-3x^2-2x+2\right)dx}{x^3+x^2-2x}$, R: $\frac{x^2}{2}-2x+\ln\left[\frac{(x+2)^3}{x(x-1)}\right]+C$

10. $\int \frac{(2x+1)dx}{x^3+4x^2+5x+2}$, R: $3\ln\left(\frac{x+1}{x+2}\right)+\frac{1}{x+1}+C$

11. $\int \frac{\left(5x^2+7\right)dx}{x^3+3x-4}$, R: $2\ln(x-1)+\frac{3}{2}\ln\left(x^2+x+4\right)-\frac{1}{\sqrt{15}}arctg\left(\frac{2x+1}{\sqrt{15}}\right)+C$

12. $\int \frac{dx}{x^4-2x^3+5x^2-8x+4}$, R: $-\frac{1}{5(x-1)}+\frac{1}{25}\ln\left[\frac{x^2+4}{(x-1)^2}\right]-\frac{3}{50}arctg\left(\frac{x}{2}\right)+C$

13. $\int \frac{dx}{(x+1)(x^2+4)^2}$, R: $\frac{1}{50}\ln\left[\frac{(x+1)^2}{x^2+4}\right]+\frac{x+4}{40(x^2+4)}+\frac{13}{400}arctg\left(\frac{x}{2}\right)+C$

14. $\int \frac{(x+1)dx}{x^3-7x^2+16x-12}$, R: $\frac{3}{x-2}+\ln\left(\frac{x-3}{x-2}\right)^4+C$

15. $\int \frac{dx}{x^5+2x^3+x}$, R: $\frac{1}{2}\ln\left(\frac{x^2}{x^2+1}\right)+\frac{1}{2(x^2+1)}+C$

16. $\int \frac{dx}{x^2+3\sqrt{x^3}}$, R: $-\frac{2}{3\sqrt{x}}+\frac{2}{9}\ln\left(\frac{\sqrt{x}+3}{\sqrt{x}}\right)+C$

17. $\int \frac{(x+5)dx}{(x+4)\sqrt{x+2}}$, R: $2\sqrt{x+2}+\sqrt{2}arctg\sqrt{\frac{x+2}{2}}+C$

18. $\int \frac{dx}{x^2+\sqrt{x^3}-2x}$, R: $\frac{1}{3}\ln\left[\frac{(\sqrt{x}-1)^2(\sqrt{x}+2)}{\sqrt{x^3}}\right]+C$

19. $\int \frac{\left(\sqrt{x^3}+\sqrt{x}-2x\right)dx}{\sqrt{x}-1}$, R: $\frac{x^2}{2}-\frac{2\sqrt{x^3}}{3}+C$

20. $\int \frac{\sqrt{x}\,dx}{x^3+2x^2-3x}$, R: $\frac{1}{4}\ln\left(\frac{\sqrt{x}-1}{\sqrt{x}+1}\right)-\frac{\sqrt{3}}{6}arctg\sqrt{\frac{x}{3}}+C$

21. $\int \frac{dx}{\sqrt{(1+x^2)^3}}$, R: $\frac{x}{\sqrt{1+x^2}}+C$

22. $\int \frac{\sqrt{2-\sqrt[3]{x}}\,dx}{\sqrt[3]{x}}$, R: $-4\sqrt{(2-\sqrt[3]{x})^3}+\frac{6}{5}\sqrt{(2-\sqrt[3]{x})^5}+C$

23. $\int \frac{\sqrt{x}\,dx}{\sqrt[4]{x^3}+1}$, R: $\frac{4\sqrt[4]{x^3}}{3}-\frac{4}{3}\ln\left(\sqrt[4]{x^3}+1\right)+C$

24. $\int \frac{dx}{\sqrt{x^3}-2x+4\sqrt{x}-8}$, R: $\frac{1}{4}\ln\left[\frac{(\sqrt{x}-2)^2}{x+4}\right]+\frac{1}{2}arctg\left(\frac{\sqrt{x}}{2}\right)+C$

25. $\int \frac{x^3 dx}{\sqrt{\left(a+bx^2\right)^3}}$, R: $\frac{2a+bx^2}{b^2\sqrt{a+bx^2}}+C$

26. $\int \frac{dx}{x\sqrt{4x^2+9}}$, R: $\frac{1}{3}\ln\left(\frac{\sqrt{9+4x^2}-3}{2x}\right)+C$

27. $\int xe^{4x}dx$, R: $\frac{e^{4t}}{4}\left(t-\frac{1}{4}\right)+C$

28. $\int arctgx\,dx$, R: $xarctgx-\frac{1}{2}\ln\left(1+x^2\right)+C$

29. $\int \frac{arcsenx}{\sqrt{x+1}}dx$, R: $2\sqrt{x+1}arcsenx+4\sqrt{1-x}+C$

30. $\int e^{3x}\cos\left(\frac{x}{3}\right)dx$, R: $\frac{e^{3x}}{82}\left[27\cos\left(\frac{x}{3}\right)+3sen\left(\frac{x}{3}\right)\right]+C$

31. $\int \left(arcsenx\right)^2 dx$, R: $x\left(arcsenx\right)^2+2\sqrt{1-x^2}arcsenx-2x+C$

32. $\int sen\left(\ln x\right)dx$, R: $\frac{x}{2}\left[sen\left(\ln x\right)-\cos\left(\ln x\right)\right]+C$