

## Lista 2 – Integrais de funções racionais por Frações Parciais

Calcule as integrais:

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

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

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

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

5.  $\int \frac{5x-10}{x^2-3x-4} dx$

6.  $\int \frac{2x^2-10x+4}{(x+1)(x-3)^2} dx$

7.  $\int \frac{x+7}{x^2-x-6} dx$

8.  $\int \frac{4x^2-7x+10}{(x+2)(3x-2)^2} dx$

9.  $\int \frac{3x^4+3x^2-5x^2+x-1}{x^2+x-2} dx$

10.  $\int \frac{x+1}{x(x-1)} dx$

11.  $\int \frac{2x^2-1}{(4x-1)(x^2+1)} dx$

12.  $\int \frac{x^2+x-2}{3x^3-x^2+3x-1} dx$

13.  $\int \frac{5x^2+20x+6}{x^3+2x^2+x} dx$

14.  $\int \frac{3x^2-10}{x^2-4x+4} dx$

15.  $\int \frac{3x^4+4x^3+16x^2+20x+9}{(x+2)(x^2+3)^2} dx$

16.  $\int \frac{2x^2-9x-9}{x^3-9x} dx$

17.  $\int \frac{11x+17}{2x^2+7x-4} dx$

18.  $\int \frac{x^5+x-1}{x^4-x^3} dx$

19.  $\int \frac{dx}{x^2-3x-4}$

20.  $\int \frac{x^2-8}{x+3} dx$

21.  $\int \frac{x^3+5x^2-x-22}{x^2+3x-10} dx$

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

23.  $\int \frac{x^3+3x^2+x+9}{(x^2+1)(x^2+3)} dx$

24.  $\int \frac{4z^2}{(z-1)(z^2-4z+3)} dz$

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

## Lista 2 – Respostas

1.  $3 \ln|x| - \ln|x-1| - \frac{5}{x-1} + C$

2.  $x + \frac{x^3}{3} + \ln \left| \frac{(x-1)^2(x+1)}{x^2} \right| + C$

3.  $2 \ln \left| \frac{x-2}{x} \right| + \frac{2}{x} + C$

4.  $\frac{x^2}{2} - 2x + \frac{1}{2} \ln|x^2 + 1| + C$

5.  $3 \ln|x+1| + 2 \ln|x-4| + C$

6.  $\frac{2}{x-3} + \ln|x-3| + \ln|x+1| + C$

7.  $2 \ln|x-3| - \ln|x+2| + C$

8.  $\ln \left( \frac{|x+2|^{5/8}}{|3x-2|^{13/72}} \right) - \frac{8}{9(3x-2)} + C$

9.  $x^3 + x + \frac{1}{3} \ln \left| \frac{x-1}{x+2} \right| + C$

10.  $\ln \left( \frac{x-1}{x} \right) + C$

11.  $-\frac{7}{34} \ln|4x-1| + \frac{6}{17} \ln|x^2+1| + \frac{3}{17} \operatorname{arc\,tg} x + C$

12.  $-\frac{7}{15} \ln|3x-1| + \frac{2}{5} \ln|x^2+1| + \frac{3}{5} \operatorname{arc\,tg} x + C$

13.  $\ln \left| \frac{x^6}{x+1} \right| - \frac{9}{x+1} + C$

17.  $\frac{5}{2} \ln|2x-1| + 3 \ln|x+4| + C$

14.  $3x + 12 \ln|x-2| - \frac{2}{x-2} + C$

18.  $\frac{x^2}{2} + x - \frac{1}{2x^2} + \ln|x-1| + C$

15.  $\ln|x+2| + \ln|x^2+3| - \frac{2}{x^2+3} + C$

19.  $\frac{1}{5} \ln \left| \frac{x-4}{x+1} \right| + C$

16.  $\ln \left| \frac{x(x+3)^2}{x-3} \right| + C$

20.  $\frac{x^2}{2} - 3x + \ln|x+3| + C$

21.  $\frac{x^2}{2} + 2x + \ln|(x+5)^{17/7}(x-2)^{4/7}| + C$

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

23.  $3 \operatorname{arc\,tg} x + \frac{1}{2} \ln|x^2+3| + C$

24.  $\ln \left| \frac{z-3}{z-1} \right|^{9/2} + \frac{1}{(z-1)^2} + \frac{5}{z-1} + C$

25.  $-\frac{4}{x} - 6 \operatorname{arc\,tg} x - \frac{1}{2(x^2+1)} - \frac{2x}{x^2+1} + C$