

1.

Determine as seguintes primitivas:

1)

$$\begin{aligned} & \int (x^2 - 4x + \frac{5}{x}) dx \\ &= \frac{x^3}{3} - \frac{4x^2}{2} - 5 \ln |x| + C \end{aligned}$$

2)

$$\begin{aligned} & \int \frac{2x+1}{x^2+x+3} dx \\ &= \ln |x^2+x+3| + C \end{aligned}$$

3)

$$\begin{aligned} & \int \frac{3}{2x-1} dx \\ &= \frac{3}{2} \int \frac{2}{2x-1} dx \\ &= \frac{3}{2} \ln |2x-1| + C \end{aligned}$$

4)

$$\begin{aligned} & \int \frac{1}{x} \cos(\ln x) dx \\ &= \sin(\ln x) + C \end{aligned}$$

5)

$$\begin{aligned} & \int \frac{\sqrt{1+2\ln x}}{x} dx \\ &= \int \frac{1}{x} (1+2\ln x)^{\frac{1}{2}} dx \\ &= \frac{1}{2} \int \frac{2}{x} (1+2\ln x)^{\frac{1}{2}} dx \\ &= \frac{1}{2} \frac{(1+2\ln x)^{\frac{3}{2}}}{\frac{3}{2}} + C \\ &= \frac{(1+2\ln x)^{\frac{3}{2}}}{3} + C \end{aligned}$$

6)

$$\begin{aligned}\int \sin x \cos^4 x dx \\ = -\frac{1}{5} \cos^5 x\end{aligned}$$

2.

Recorrendo à primitivação por partes, determine as seguintes primitivas:

1)

$$\begin{aligned}\int x \sin 2x dx \\ f' = \sin 2x \quad f' = -\frac{1}{2} \cos 2x \\ g = x \quad g' = 1 \\ = -\frac{x}{2} \cos 2x - \int \cos 2x dx \\ = -\frac{x}{2} \cos 2x + \frac{1}{2} \int \cos 2x dx \\ = -\frac{x}{2} \cos 2x + \frac{1}{4} \sin 2x + C\end{aligned}$$