

DZ (5)

1. Koristeći metodu parcijalne integracije, integriraj:

a) $\int x \sin x dx$ (Rj: $-x \cos x + \sin x + C$)

b)* $\int x^3 \cos x dx$ ($x^3 \sin x + 3x^2 \cos x - 6x \sin x - 6 \cos x + C$)
/više puta parcijalno integrirati/

c)* $\int x^2 \sin x dx$ ($-x^2 \cos x + 2x \sin x + 2 \cos x + C$)

d) $\int e^x \cos x dx$ ($\frac{e^x}{2}(\cos x + \sin x) + C$)

e)* $\int x^2 e^x dx$ ($x^2 e^x - 2x e^x + 2e^x + C$)

f) $\int \ln x \cdot x^2 dx$ ($\frac{x^3}{3} \ln x - \frac{x^3}{9} + C$)

2. Integriraj:

a) $\int \frac{dx}{x^2 + 6x + 13}$ (Rj: $\frac{1}{2} \arctg \frac{x}{2} + C$)

b) $\int \frac{dx}{(x-2)^4}$ ($-\frac{1}{3(x-2)^3} + C$)

c) $\int \frac{x^3}{(x+1)^4} dx$ ($\ln|x+1| + \frac{3}{x+1} - \frac{3}{2(x+1)^2} + \frac{1}{3(x+1)^3} + C$)

d) $\int \frac{x^5 - 2x^4 + 2x^3 - 7x^2 + 10x + 2}{x^2 - 2x} dx$ ($\frac{x^4}{4} + x^2 - 3x - \ln|x| + 5 \ln|x-2| + C$)

e) $\int \frac{-2x^2 - 6x - 12}{x^3 - x^2 - 5x - 3} dx$ ($\ln|x+1| - \frac{2}{x+1} - 3 \ln|x-3| + C$)

f) $\int \frac{dx}{5x-2}$ ($\frac{1}{5} \ln|5x-2| + C$)

$$\text{g) } \int \frac{4x^2 + 3x + 8}{x^3 + x^2 - 4x} dx \quad (2 \ln |x| + \ln |x^2 + x + 4| + C)$$

$$\text{h) } \int \frac{dx}{2x^2 + 8x + 8} \quad \left(-\frac{1}{2(x+2)} + C\right)$$

$$\text{i) } \int \frac{x + 2}{2x^2 + 8x - 5} dx \quad \left(\frac{1}{4} \ln |2x^2 + 8x - 5| + C\right)$$