EZ OHRIDA - 2023

A4 $\int \underbrace{(x^2+1)}_{u} \cdot \underbrace{e^{x+1}dx}_{dv}$

ZANKASKO METODA
$\int u\,dv = u\cdot v - \int v\cdot du$

$$I \begin{cases} u = x^2+1 \longrightarrow du = 2x\cdot dx \\ dv = e^{x+1}\cdot dx \longrightarrow v = \int e^{x+1}dx = e^{x+1} \end{cases}$$

$$I = (x^2+1)\cdot e^{x+1} - \underbrace{\int e^{x+1}\cdot 2x\cdot dx}_{I_2}$$
E P

$$I_2 \begin{cases} u = 2x \longrightarrow du = 2\cdot dx \\ dv = e^{x+1}dx \longrightarrow v = \int e^{x+1}\cdot dx = e^{x+1} \end{cases}$$

$$I_2 = 2x\cdot e^{x+1} - \int e^{x+1}\cdot 2\cdot dx = 2x\cdot e^{x+1} - 2\int e^{x+1}dx$$
$$= 2x e^{x+1} - 2\cdot e^{x+1}$$

$$I = (x^2+1)\cdot e^{x+1} - I_2$$
$$I = (x^2+1)\cdot e^{x+1} - \left[2x\cdot e^{x+1} - 2\cdot e^{x+1}\right] =$$
$$I = e^{x+1}(x^2+1-2x+2) = \boxed{e^{x+1}(x^2-2x+3)+k}$$