

"ZATKA" integratu.Un Dia Vi \rightarrow Una Vaca Sin Pabo Vesna De Unif.
 $u \Rightarrow$

A	L	P	E	S
arcs	log	pol	exp	sin, cos

$$1) \int \underset{P}{x} \underset{S}{\sin x} dx$$

$$u = x \quad du = dx$$

$$dv = \sin x dx$$

$$v = \int \sin x dx = -\cos x$$

$$I = \int u dv = u \cdot v - \int v \cdot du$$

$$I = \int \underbrace{x}_u \underbrace{\sin x}_{dv} dx = x \cdot (-\cos x) - \int -\cos x \cdot dx =$$

$$= -x \cos x + \sin x + k$$

$$\textcircled{3} \int x^4 e^x dx$$

$$u = x^4 \quad du = 4x^3 dx$$

$$dv = e^x dx$$

$$v = \int e^x dx = e^x$$

$$I = \int x^4 e^x dx = u \cdot v - \int v \cdot du = x^4 \cdot e^x - \int 4x^3 e^x dx$$

$$= x^4 \cdot e^x - 4 \int x^3 e^x dx$$

$$\textcircled{2} \quad u = x^3 \quad du = 3x^2 dx$$

$$dv = e^x dx$$

$$v = e^x$$

$$I = x^4 \cdot e^x - 4 \left[x^3 \cdot e^x - \int e^x \cdot 3x^2 dx \right]$$

$$I = x^4 \cdot e^x - 4x^3 e^x + 12 \int e^x \cdot x^2 dx$$

$$\textcircled{3} \quad u = x^2 \quad du = 2x dx$$

$$dv = e^x dx \quad v = e^x$$

$$I = x^4 \cdot e^x - 4x^3 \cdot e^x + 12 \left[x^2 \cdot e^x - \int e^x \cdot 2x dx \right]$$

$$= x^4 \cdot e^x - 4x^3 \cdot e^x + 12x^2 \cdot e^x - 24 \int e^x \cdot x \cdot dx$$

$$\textcircled{4} \quad u = x \quad du = dx$$

$$dv = e^x dx \quad v = e^x$$

$$I = x^4 e^x - 4x^3 e^x + 12x^2 \cdot e^x - 24 \left[x \cdot e^x - \int e^x dx \right] =$$

$$\boxed{I = x^4 e^x - 4x^3 e^x + 12x^2 \cdot e^x - 24x \cdot e^x + 24e^x + K}$$

4

$$\int \sin^2 x \, dx = \int \frac{1 - \cos 2x}{2} \, dx = \int \left(\frac{1}{2} - \frac{\cos 2x}{2} \right) dx = \frac{1}{2}x - \frac{1}{4} \sin 2x + k$$

$$\sin 2x = 2 \sin x \cos x$$

$$= \frac{1}{2}x - \frac{2 \sin x \cos x}{4} + k = \frac{1}{2}x - \frac{\sin x \cos x}{2} + k$$

ZADKA INTEGRATVE !!

$$I = \int \sin^2 x \, dx$$

$$u = \sin x \quad du = \cos x \, dx$$

$$dv = \sin x \, dx \quad v = \int \sin x \, dx = -\cos x$$

$$I = -\sin x \cos x - \int -\cos^2 x \, dx$$

$$I = -\sin x \cos x + \int \cos^2 x \, dx =$$

$$I = -\sin x \cos x + \int (1 - \sin^2 x) \, dx =$$

$$I = -\sin x \cos x + x - \underbrace{\int \sin^2 x \, dx}_I$$

$$I = -\sin x \cos x + x - I$$

$$2I = -\sin x \cos x + x$$

$$I = \frac{-\sin x \cos x + x}{2}$$

$$I = \frac{1}{2}x - \frac{\sin x \cos x}{2} + k$$

Bi
TODJABA

340) 2) $\int_P \textcircled{A} x \cdot \arctg x \, dx.$

ZATIKAKO METODOA

$$\begin{cases} u = \arctg x \rightarrow du = \frac{dx}{1+x^2} \\ dv = x \, dx \rightarrow v = \int x \, dx = \frac{x^2}{2} \end{cases}$$

$$I = \arctg x \cdot \frac{x^2}{2} - \int \frac{x^2}{2} \cdot \frac{dx}{1+x^2} = \frac{1}{2} x^2 \arctg x - \frac{1}{2} \underbrace{\int \frac{x^2}{1+x^2} dx}_{I_1}$$

$$I_1 = \int \frac{x^2}{1+x^2} dx$$

Def $P(x) \geq \text{Def } Q(x) \rightarrow \text{zatikito}$

$$\begin{array}{r} x^2 \quad \underline{1+x^2} \\ -x^2-1 \quad \underline{1} \\ -1 \end{array} \quad \boxed{I_1 = \int \left(1 - \frac{1}{1+x^2} \right) dx = x - \arctg x}$$

$$I = \frac{1}{2} x^2 \arctg x - \frac{1}{2} [x - \arctg x] + k$$

$$\boxed{I = \frac{1}{2} [x^2 \arctg x - x + \arctg x] + k.}$$

edo.

$$I = \frac{1}{2} \arctg x (x^2 + 1) - \frac{1}{2} x + k$$