

340.orr "ZATIKA" integratu.

Un DiaVi → Una Vaca SIN PESO Vestida De UNA F.

$u \Rightarrow$  A arcs L log P pol E exp S siu(x)

$$1) \int x \sin x \, dx \quad u = x \quad du = dx$$

$$du = \sin x \, dx$$

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

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

$$I = \int x \sin x \, dx = x \cdot (-\cos x) - \int -\cos x \cdot dx =$$
$$= -x \cos x + \sin x + k$$

$$\boxed{3} \quad \int_P^4 x^4 e^x dx$$

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

$$du = e^x dx$$

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

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

(2)

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

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

$$du = e^x dx$$

$$v = e^x.$$

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

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

(3)

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

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

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

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

(4)

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

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

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

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

FORM.  
Trig.

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

$\sin 2x = 2 \sin x \cos x$   
 $= \frac{1}{2}x - \frac{2 \sin x \cos x}{4} + K = \boxed{\frac{1}{2}x - \frac{\sin x \cdot \cos x}{2} + K}$

ZÄHLENKA INTEGRIEREN!!

$$I = \int \sin^2 x \, dx \quad u = \sin x \quad du = \cos x \, dx$$

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

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

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

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

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

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

$$I = \underline{-\sin x \cdot \cos x + x}$$

$$\boxed{I = \frac{1}{2}x - \frac{\sin x \cdot \cos x}{2} + K}$$

Bsp  
TSDJTB

340) 2)  $\int x \cdot \arctg x \, dx.$  ZATIKAKO METODA

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

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

I<sub>1</sub>

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

Deg P(x) ≥ Deg Q(x) → zatikito

$$\frac{x^2}{1+x^2} = \frac{x^2}{x^2+1} = \frac{-x^2-1}{-1}$$

$$I_1 = \int \left(1 - \frac{1}{1+x^2}\right) dx = x - \arctg x$$

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

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

edo.

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