

TAULA D'INTEGRALS IMMEDIATES

$$1.- \int [f(x)]^n \cdot f'(x) \cdot dx = \frac{1}{n+1} [f(x)]^{n+1} + C$$

(n ≠ -1)

Cas particular:

$$\int \frac{f'(x)}{\sqrt[n]{f(x)^{n-1}}} dx = \int f'(x) [f(x)]^{-\frac{n-1}{n}} dx = n \sqrt[n]{f(x)} + C$$

Exemples:

$$1.1.- \int (2x+1)(x^2+x) dx = \frac{(x^2+x)^2}{2} + C$$

$$1.2.- \int \frac{\operatorname{tg} x}{\cos^2 x} dx = \frac{\operatorname{tg}^2 x}{2} + C$$

$$1.3.- \int \cos x \cdot \sin^2 x \cdot dx = \frac{\sin^3 x}{3} + C$$

$$1.4.- \int \sqrt{x+1} dx = \frac{(x+1)^{3/2}}{3/2} + C$$

$$1.5.- \int 2x\sqrt{x^2+1} dx = \frac{(x^2+1)^{3/2}}{3/2} + C$$

$$1.6.- \int \frac{2x}{\sqrt[3]{(x^2+1)^2}} dx = 3\sqrt[3]{x^2+1} + C$$

$$1.7.- \int \cos x \sqrt{\sin x} dx = \frac{(\sin x)^{3/2}}{3/2} + C$$

$$2.- \int \frac{f'(x)}{f(x)} dx = \ln|f(x)| + C$$

Exemples:

$$2.1.- \int \frac{1}{x} dx = \ln|x| + C$$

$$2.2.- \int \frac{2x}{x^2+1} dx = \ln(x^2+1) + C$$

$$2.3.- \int \frac{3}{3x-1} dx = \ln|3x-1| + C$$

$$2.4.- \int \cot gx dx = \ln|\sin x| + C$$

$$3.- \int a^{f(x)} f'(x) dx = \frac{1}{\ln a} a^{f(x)} + C$$

Exemples:

$$3.1.- \int e^x dx = e^x + C$$

$$3.2.- \int 2^x dx = \frac{1}{\ln 2} 2^x + C$$

$$3.3.- \int 2x \cdot e^{x^2+1} dx = e^{x^2+1} + C$$

$$4.- \int f'(x) \cos f(x) dx = \sin f(x) + C$$

Exemples:

$$4.1.- \int \cos x dx = \sin x + C$$

$$4.2.- \int 2x \cos(x^2+2) dx = \sin(x^2+2) + C$$

$$4.3.- \int e^x \cos e^x dx = \sin e^x + C$$

$$5.- \int f'(x) \sin f(x) dx = -\cos f(x) + C$$

Exemples:

$$5.1.- \int \sin x dx = -\cos x + C$$

$$5.2.- \int \frac{\sin \sqrt{x}}{2\sqrt{x}} dx = -\cos \sqrt{x} + C$$

$$5.3.- \int 3x^2 \sin x^3 dx = -\cos x^3 + C$$

6.-

$$\int \frac{f'(x)}{\cos^2 f(x)} dx = \int (1 + \operatorname{tg}^2 f(x)) f'(x) dx = \operatorname{tg} f(x) + C$$

Exemples:

$$6.1.- \int \frac{1}{\cos^2 x} dx = \int (1 + \operatorname{tg}^2 x) dx = \operatorname{tg} x + C$$

$$6.2.- \int [1 + \operatorname{tg}^2(x^3+1)] \cdot 3x^2 dx = \operatorname{tg}(x^3+1) + C$$

$$6.3.- \int \frac{e^x}{\cos^2 e^x} dx = \operatorname{tg} e^x + C$$

$$7.- \int \frac{f'(x) \cos f(x)}{\sin^2 f(x)} dx = -\operatorname{cosec} f(x) + C$$

Exemple:

$$7.1.- \int \frac{\cos x}{\sin^2 x} dx = -\operatorname{cosec} x + C$$

$$8.- \int \frac{f'(x) \sin f(x)}{\cos^2 f(x)} dx = \sec f(x) + C$$

Exemple:

$$8.1.- \int \frac{\sin x}{\cos^2 x} dx = \sec x + C$$

9.-

$$\int \frac{f'(x)}{\sin^2 f(x)} dx = \int (1 + \cot^2 f(x)) f'(x) dx = -\cot gf(x) + C$$

Exemple:

$$9.1.- \int \frac{1}{\sin^2 x} dx = \int (1 + \cot^2 x) dx = -\cot gx + C$$

$$10.- \int \frac{f'(x)}{\sqrt{1-[f(x)]^2}} dx = \arcsin f(x) + C$$

Exemples:

$$10.1.- \int \frac{1}{\sqrt{1-x^2}} dx = \arcsin x + C$$

$$10.2.- \int \frac{2}{\sqrt{1-4x^2}} dx = \arcsin 2x + C$$

$$10.3.- \int \frac{\sqrt{3}}{\sqrt{1-3x^2}} dx = \arcsin \sqrt{3}x + C$$

$$11.- \int \frac{f'(x)}{1+[f(x)]^2} dx = \operatorname{arctg} f(x) + C$$

Exemples:

$$11.1.- \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + C$$

$$11.2.- \int \frac{3}{1+9x^2} dx = \operatorname{arctg} 3x + C$$

$$11.3.- \int \frac{e^x}{1+e^{2x}} dx = \operatorname{arctg} e^x + C$$