

# Analisi Matematica 1 - Lista n. 18

Calcolo della primitiva per sostituzione

Titolo nota

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Calcolare le seguenti primitive riconducendole alla forma  $\int f(g(x))g'(x) dx$

$$1) \int \frac{1}{\sqrt{x} e^{\sqrt{x}}} dx = -2 e^{-\sqrt{x}} \quad 2) \int \sin x e^{\cos x} dx = -e^{\cos x}$$

$$3) \int \frac{\sin(\ln x)}{x} dx = -\cos(\ln x) \quad 4) \int \frac{\cos \sqrt{x}}{\sqrt{x}} dx = 2 \sin \sqrt{x}$$

$$5) \int e^{2x} \ln(1+e^x) dx = \frac{e^{2x}-1}{2} \ln(e^x+1) - \frac{e^{2x}-2e^x-3}{4} \quad 6) \int \frac{x+1}{x^2+2x+3} dx = \frac{1}{2} \ln(x^2+2x+3)$$

$$7) \int \tan x \ln(\cos x) dx = -\frac{1}{2} (\ln(\cos x))^2 \quad 8) \int \frac{1+\tan^2 x}{\sqrt{1+\tan x}} dx = 2\sqrt{1+\tan x}$$

$$9) \int \frac{2 \arcsin(2x)}{\sqrt{1-4x^2}} dx = \frac{1}{2} (\arcsin(2x))^2 \quad 10) \int \frac{x e^{\arctan(x^2)}}{1+x^4} dx = \frac{1}{2} e^{\arctan(x^2)}$$

$$11) \int \sqrt{\frac{2+\sqrt{x}}{x}} dx = \frac{4}{3} (2+\sqrt{x})\sqrt{2+\sqrt{x}} \quad 12) \int \frac{x}{\sqrt{1-x^4}} dx = \frac{1}{2} \arcsin(x^2)$$

$$13) \int e^{6x+e^{2x}} dx = \left(\frac{e^{4x}}{2} - e^{2x} + 1\right) e^{e^{2x}} \quad 14) \int \frac{x^2}{1+x^6} dx = \frac{1}{3} \arctan(x^3)$$

$$15) \int \frac{2x+3}{\sqrt{3x^2+9x+5}} dx = \frac{2}{3} \sqrt{3x^2+9x+5} \quad 16) \int \frac{e^x}{e^{2x}+2e^x+2} dx = \arctan(e^x+1)$$

$$17) \int \frac{\ln x}{x \sqrt{1+\ln^2 x}} dx = \sqrt{1+(\ln x)^2} \quad 18) \int \frac{\sin x}{\cos^2 x} dx = \frac{1}{\cos x}$$

$$19) \int \tan^4 x + \tan^2 x dx = \frac{1}{3} (\tan x)^3 \quad 20) \int \tan^3 x + \tan x dx = \frac{1}{2} (\tan x)^2$$

$$21) \int \tan^7 x dx = \frac{\tan^6 x}{6} - \frac{\tan^4 x}{4} + \frac{\tan^2 x}{2} + \ln|\cos x| \quad 22) \int \tan^8 x dx = \frac{\tan^7 x}{7} - \frac{\tan^5 x}{5} + \frac{\tan^3 x}{3} - \tan x + x$$