Integrali

Es. 1. Calcolate i seguenti integrali indefiniti

$$\int (x+7)^{20}\,dx \qquad \int \frac{1}{x}-\frac{1}{x^3}\,dx \qquad \int \frac{1}{3x^2-2x}\,dx \qquad \int \sqrt{\sin x}\cos x\,dx$$

$$\int \frac{1}{\arctan x}\frac{1}{1+x^2}\,dx \qquad \int\int \frac{\log x}{x}\,dx \qquad \int x\sin x\,dx \qquad (\int \sqrt{x}-\sin x)\,dx$$

$$\int \frac{1}{\sqrt[4]{3x}}\,dx \qquad \int \sin x\cos^3 x\,dx \qquad \int \frac{3x+5x^7}{x^2}\,dx \qquad \int \frac{1}{4x^2-9}\,dx$$

$$\int \frac{\cos x}{1+\sin x} \qquad \int e^x x^2\,dx \qquad \int \frac{3x-2}{x^2+4x+4}\,dx \qquad \int \sin\sqrt{x}$$

Es. 2. Calcolate i seguenti integrali definiti

$$\int_1^3 xe^x\,dx \qquad \int_0^{\frac{\pi}{4}} (\cos x+3x)\,dx \qquad \int_{-1}^1 \frac{1}{x^2-4}\,dx \qquad \int_1^4 \frac{1}{\sqrt{x}}\,dx$$

$$\int_0^1 (x+2)e^{2x}\,dx \qquad \int_1^2 \frac{1-e^{-x}}{1+e^{-x}}\,dx \qquad \int_0^{\pi} \sin x\,dx \qquad \int_0^{\frac{\pi}{4}} \tan^2 x\,dx$$

$$\int_0^1 \frac{x^3}{2x+1}\,dx \qquad \int_e^{2e} \log x\,dx \qquad \int_0^{\frac{\pi}{3}} \frac{\tan x}{1+\log\cos x}\,dx \qquad \int_{-3}^3 (x^2+3x)\,dx$$

Es. 3. Calcolate le seguenti funzioni integrali

$$F(x)=\int_0^x t^2\,dt \qquad F(x)=\int_\pi^x \cos x\,dt \qquad F(x)=\int_0^x \frac{1}{1+t}\,dt$$

$$F(x)=\int_0^x \frac{1}{1+9t^2}\,dt \qquad F(x)=\int_\pi^x e^t\cos(2t)\,dt \qquad F(x)=\int_0^x \frac{1}{e^t+e^{-t}}\,dt$$

Es. 4. Calcolate l'area delle seguenti figure (è consigliato fare il disegno)

$\{(x,y)\in R^2 \mid x\in[1,3],\ x^2-4x+3\le y\le 0\}$ $\{(x,y)\in R^2 \mid x\in[0,2],\ x^3-x\le y\le 3x\}$

$\{(x,y)\in R^2 \mid x\in[-1,5],\ x^2-4x\le y\le 5\}$ $\{(x,y)\in R^2 \mid y\in[0,2],\ x^2\le y\le 6-x\}$