Integrali indefiniti

Esercizio 1. *Calcolare i seguenti integrali indefiniti:*

$$\int x^3 \, dx, \quad \int \sqrt{x} \, dx, \quad \int x^{-3} \, dx, \int \frac{x^2}{\sqrt{x}} \, dx, \quad \int \frac{x^5 + x^4 + 1}{x^2} \, dx,$$

$$\int \frac{1 + x^3}{2x^2} \, dx, \quad \int \left(\frac{1}{x} + x \right) dx, \quad \int \frac{3x^2 + 4x}{x^2} \, dx, \quad \int \frac{1 + x^2}{3x} \, dx,$$

$$\int (3x^2 + e^x) \, dx, \quad \int \left(\frac{2}{x} + 6e^x \right) dx, \quad \int \left(\frac{x^2}{6x^5} + 7e^x + 9\frac{1}{x} \right) dx,$$

$$\int (x + 5)^2 \, dx, \quad \int 2(2x + 1)^2 \, dx, \quad \int \frac{1}{(x + 1)^2} \, dx, \quad \int 2\sqrt{2x - 3} \, dx,$$

$$\int (1 + 2x)(1 + x + x^2)^4 \, dx, \quad \int x\sqrt{5 + 4x^2} \, dx, \quad \int \frac{1}{x} \ln^2(x) \, dx,$$

$$\int \frac{5}{5x + 1} \, dx, \quad \int \frac{x^2}{1 - x^3} \, dx, \quad \int \frac{2x + 1}{x^2 + x - 3} \, dx, \quad \int \frac{e^x}{e^x + 1} \, dx,$$

$$\int \frac{2e^x}{4 + 3e^x} \, dx, \quad \int \frac{e^{2x}}{3 - e^{2x}} \, dx, \quad \int \frac{e^{4x} - 1}{e^{4x} - 4x + 1} \, dx, \quad \int \frac{1}{x \ln x} \, dx.$$

Integrali definiti

Esercizio 2. *Calcolare i seguenti integrali definiti:*

$$\int_0^2 (x^2 - 3x + 1) \, dx, \quad \int_0^2 (2 + x)^2 \, dx, \quad \int_0^{\frac{1}{2}} (4x + 1)^3 \, dx, \quad \int_0^2 x(3x + 1)^2 \, dx,$$

$$\int_0^9 (\sqrt{x} - x) \, dx, \quad \int_1^e \left(\frac{2}{x} + \frac{1}{x^2} \right) dx, \quad \int_0^3 \frac{2x}{1 + x^2} \, dx, \quad \int_0^2 \frac{3x^2}{x^3 + 1} \, dx,$$

$$\int_0^{\frac{1}{2}} e^{4x} \, dx, \quad \int_0^1 \frac{e^x}{3e^x + 2} \, dx, \quad \int_0^{2\sqrt{2}} \frac{x}{\sqrt{1 + x^2}} \, dx, \quad \int_1^e \frac{1}{x} \ln^3(x) \, dx.$$