

Esercitazione sul calcolo di integrali indefiniti

$$1) \int \left(x^2 - \frac{1}{2}x \right)^2 dx = \quad \text{R: } \frac{x^5}{5} - \frac{x^4}{4} + \frac{x^3}{12} + C$$

$$2) \int \frac{\sqrt[3]{x^2} - 3\sqrt{x} + x}{\sqrt[4]{x}} dx = \quad \text{R: } \frac{12x^{\frac{17}{12}}}{17} - \frac{12x^{\frac{5}{4}}}{5} + \frac{4x^{\frac{7}{4}}}{7} + C$$

$$3) \int \frac{(x^3 - 1)(x + 1)}{x^4} dx = \quad \text{R: } x + \ln|x| + \frac{1}{2x^2} + \frac{1}{3x^3} + C$$

$$4) \int (2^x - \pi)^3 dx = \quad \text{R: } \frac{1}{3} \cdot \frac{2^{3x}}{\ln(2)} - \frac{3\pi}{2} \cdot \frac{2^{2x}}{\ln(2)} + 3\pi^2 \cdot \frac{2^x}{\ln(2)} - \pi^3 x + C$$

$$5) \int \frac{\pi}{\pi x + 5} dx = \ln|\pi x + 5| + C$$

$$6) \int \frac{(x^2 - x + 1)^2}{x^3} dx = \quad \text{R: } \frac{x^2}{2} - 2x + 3\ln|x| + \frac{2}{x} - \frac{1}{2x^2} + C$$

$$7) \int e^{2x-3} dx = \frac{e^{2x-3}}{2} + C$$

$$8) \int (e^{-x} + e^{2x})^2 dx = \quad \text{R: } -\frac{e^{-2x}}{2} + 2e^x + \frac{e^{4x}}{4} + C$$

$$9) \int \frac{(e^{3x} - 1)^2}{e^{4x}} dx = \quad \text{R: } \frac{e^{2x}}{2} + 2e^{-x} - \frac{e^{-4x}}{4} + C$$

$$10) \int \frac{x}{5x^2 + 1} dx = \quad \text{R: } \frac{1}{10} \ln(5x^2 + 1) + C$$

$$11) \int \frac{5e^x}{2e^x + 1} dx = \quad \text{R: } \frac{5}{2} \ln(2e^x + 1) + C$$

$$12) \int \frac{2x^2 + x - 7}{x + 1} dx = \quad \text{R: } x^2 - x - 6\ln|x + 1| + C$$

$$13) \int \frac{x^3 - 2x^2 - 4}{2x - 1} dx = \quad \text{R: } \frac{x^3}{6} - \frac{3}{8}x^2 - \frac{3}{8}x - \frac{35}{16} \cdot \ln|2x - 1| + C$$

$$14) \int \frac{x^2 + 2}{x + 1} dx = \frac{x^2}{2} - x + 3\ln|x + 1| + C$$

$$15) \int \frac{x^3 - 4x + 8}{2x - 3} dx = \quad \text{R: } \frac{x^3}{6} + \frac{3}{8}x^2 - \frac{7}{8}x - \frac{43}{16} \cdot \ln|2x - 3| + C$$

$$16) \int \frac{x^2 - 4x + 4}{x + 2} dx = \frac{x^2}{2} - 6x - 16 \cdot \ln|x + 2| + C$$

$$17) \int \frac{2x + 1}{x^2 + x} dx = \ln|x^2 + x| + C$$

$$18) \int \frac{\sin x}{\cos x} dx = -\int \frac{-\sin x}{\cos x} dx = -\ln|\cos x| + C$$

$$19) \int (31x + 13)^{33} dx = \quad \text{R: } \frac{(31x + 13)^{34}}{1054} + C$$

$$20) \int \frac{(2 - x)^2 (x + 2)^2 - x^4}{2x^5} dx = \quad \text{R: } \frac{1}{2x^2} - \frac{2}{x^4} + C$$