

## Calcolo - Esercizi - 19/3/2004

(1) Calcolare i seguenti integrali indefiniti

$$\begin{array}{lll} (a) \int x \sin(2x) dx & (b) \int x^2 \sin x dx & (c) \int e^{2x} + 2^x + xe^{-x^2} dx \\ (d) \int \sin x \cos^3 x dx & (e) \int \log^2 x dx & (f) \int \sqrt[3]{2x-1} dx \\ (g) \int \frac{\cos x}{\sqrt[3]{\sin x}} dx & (h) \int \cos^3 x dx & (i) \int \cos(2x) \sin x dx \\ (j) \int \frac{1}{x \log x} dx & (k) \int \frac{\sqrt{x}}{2+x} dx & (l) \int \frac{3x}{1+x^2} dx \\ (m) \int \frac{2x-1}{2+x^2} dx & (n) \int \frac{x}{x^2-x-2} dx & (o) \int \frac{x^2}{x^2-2x+1} dx \\ (p) \int \frac{1}{1+\cos x} dx & (q) \int \frac{3x+4}{x^2+x+4} dx & (r) \int \frac{2x^3}{x^4+2x^2-3} dx \end{array}$$

(2) Calcolare i seguenti integrali definiti

$$\begin{array}{lll} (a) \int_0^1 5x^2(1-2x^3)^4 dx & (b) \int_{-\frac{\pi}{4}}^0 \operatorname{tg} x dx & (c) \int_1^3 \frac{x^3}{1+x^4} dx \\ (d) \int_0^1 \frac{x-1}{x^2+1} dx & (e) \int_{-\pi}^{\pi} x \cos(x^2) dx & (f) \int_1^e \frac{\log x}{\sqrt{x}} dx \end{array}$$

*Suggerimento per (1)(r):* in alternativa, può essere utile scrivere  $x^3 = x^2x$  a numeratore.

*Soluzioni di (2):* (a)  $1/3$ ; (b)  $-\frac{1}{2} \log 2$ ; (c)  $(\log 41)/4$ ; (d)  $\frac{1}{2} \log 2 - \frac{\pi}{4}$ ; (e)  $0$ ; (f)  $4 - 2\sqrt{e}$ ;