Esercizi inerenti il calcolo integrale (definito). Analisi Matematica L-A (CdL Elettronica e Automazione A.A. 05/06)

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1. Calcolare i seguenti integrali:

   (a) $\int_1^2 \left(x^2 + x + 1\right) \log\left(3x\right) \ dx$,

   (b) $\int_0^2 x\sqrt{4 - x^2} \ dx$,

   (c) $\int_0^2 \sqrt{9 - x^2} \ dx$,

   (d) $\int_0^1 x \mathrm{arctg} x \ dx$,

   (e) $\int_0^{\frac{\pi}{2}} e^{\mathrm{sen}^2 x} \mathrm{sen} x \cos x \ dx$,

   (f) $\int_{-\pi}^{\pi} e^{\mathrm{sen}^2 x} \mathrm{sen}^3 x \cos x \ dx$,

   (g) $\int_{\frac{1}{4}}^{\frac{1}{2}} \frac{1}{x^2} \log\left(1 - x^2\right) \ dx$,

   (h) $\int_2^4 \frac{1}{1 - x^2} \ dx$,

   (i) $\int_{-\frac{1}{2}}^{\frac{1}{2}} \frac{1}{1 - x^2} \ dx$,

   (j) $\int_0^1 x e^{\sqrt{x}} \ dx$,

   (k) $\int_0^{\pi} \mathrm{arctg}\left(\mathrm{sen} x\right) \cos x \ dx$,

   (l) $\int_1^5 \log^3\left(3x + 1\right) \ dx$,

   (m) $\int_0^{\frac{1}{\sqrt{2}}} x\sqrt{4 - x^4} \ dx$,

   (n) $\int_{\frac{\pi}{8}}^{\frac{\pi}{4}} \frac{\cos^3(2x)}{5\mathrm{sen}(2x) + \mathrm{sen}^2(2x)} \ dx$,

   (o) $\int_0^7 \mathrm{arctg}\left(\frac{4}{x + 7}\right) \ dx$,

   (p) $\int_0^1 \left(3x + \sqrt{4 - x^2}\right) \ dx$.