Universitá degli Studi Roma Tre - Corso di Laurea in Matematica

Tutorato di AM120

A.A. 2013-2014 - Docente: Prof. G.Mancini

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1. Calcolare i seguenti integrali:

   (a) $\int \frac{dx}{\cos^2(3x+5)}$

   (b) $\int (x+1)^3 \cos(x)dx$

   (c) $\int \cosh^2(x)dx$

   (d) $\int x^2 \sin(x)dx$

   (e) $\int \frac{x^5 - x + 1}{x^4 + x^2}dx$

   (f) $\int \frac{3x}{x^3 - 1}dx$

   (g) $\int \frac{3x - 4}{x^2 - 6x + 8}dx$

   (h) $\int e^{\sin(x)} \cos(x)dx$

   (i) $\int x \cosh(3x)dx$

   (j) $\int \frac{\log(x)}{\sqrt{x}}dx$

   (k) $\int \frac{5x^2 + 11x - 2}{(x+5)(x^2+9)}dx$

   (l) $\int \frac{x^2}{(x+2)(x-1)^2}dx$

   (m) $\int \arcsin(x)dx$

   (n) $\int \text{sign}(x)dx$

   (o) $\int \left(x + \frac{1}{x^2}\right) \arctan(x)dx$

   (p) $\int \frac{dx}{(x^4-1)(x^4+x^2+1)}$

2. Calcolare i seguenti integrali definiti:

   (a) $\int_1^e \frac{\log(\sinh(x) + \cosh(x))}{x^2}dx$

   (b) $\int_0^{\ln(2)} \frac{dx}{e^x + 1}$

   (c) $\int_0^1 \sin(\arccos(x))dx$

   (d) $\int_0^{2\pi} \frac{\cos^2(x)}{1 + \sin(x)}dx$

   (e) $\int_1^{\sqrt{e}} \frac{dx}{x\sqrt{1 - \log^2(x)}}$

   (f) $\int_2^3 \frac{x-2}{x(x^2-1)}dx$

   (g) $\int_2^{10} 2^x dx$

   (h) $\int_{\frac{\pi}{4}}^{\arctan(e^{4096})} \frac{dx}{\sin(2x)}$

3. Calcolare:

   - $\int_0^{2\pi} \cos^n(x)dx$
   - $\int_0^{2\pi} \sin^n(x)dx$