Esercizi sugli integrali impropri

Lista n.2 di martedì 19 marzo 2002

Studiare la convergenza dei seguenti integrali impropri:

[37] $\displaystyle\int_0^1 \frac{1}{\sqrt{x}} \sin\left(\frac{1}{x}\right)\, dx$

[38] $\displaystyle\int_0^{+\infty} \frac{\sin(\log x)}{x^4 + \sqrt[4]{x}}\, dx$

[39] $\displaystyle\int_0^{+\infty} \frac{\sin(\log x)}{x^4 - \sqrt[4]{x}}\, dx$

[40] $\displaystyle\int_{-\infty}^{+\infty} \frac{\sin(\sin x)}{(1+x^2)\log(2+x^2)}\, dx$

[41] $\displaystyle\int_2^{+\infty} \frac{1 - 3\sin x}{x^2}\, dx$

[42] $\displaystyle\int_2^{+\infty} \frac{\cos(e^x)}{x^2 \log^3 x}\, dx$

[43] $\displaystyle\int_{\frac{1}{2}}^{+\infty} \frac{\sin(x^3)}{x^3\sqrt{|\log x|}}\, dx$

[44] $\displaystyle\int_0^2 \frac{1}{\sqrt{x^2 - 2x}\sin x}\, dx$

[45] $\displaystyle\int_{-1}^1 \frac{\sin x}{x^2 - 1}\, dx$

[46] $\displaystyle\int_0^1 \frac{e^x}{x\log^2 x}\, dx$

[47] $\displaystyle\int_0^1 \frac{\cot(\pi x)}{\sqrt[3]{\log^4 x}}\, dx$

[48] $\displaystyle\int_2^3 \frac{1}{\sqrt[3]{x^2 - 5x + 6}}\, dx$

[49] $\displaystyle\int_2^3 \frac{1}{(x^2 - 5x + 6)^2}\, dx$

[50] $\displaystyle\int_0^{+\infty} \frac{2 + \sin(e^x)}{\log(1 + x^x)}\, dx$

[51] $\displaystyle\int_{-\infty}^{+\infty} \cos\left(e^{-x}\right)\, dx$

[52] $\displaystyle\int_{-1}^1 \log\left(\frac{1+x}{1-x}\right)\, dx$

[53] $\displaystyle\int_{-\pi}^{+\pi} \log\left(\frac{1+\sin x}{1-\sin x}\right)\, dx$

[54] $\displaystyle\int_{-1}^1 e^{\frac{1}{x}}\, dx$

[55] $\displaystyle\int_2^{+\infty} \frac{\sin^4 x + \cos^4 x}{x\log x}\, dx$

[56] $\displaystyle\int_1^{+\infty} \frac{e^{\sin x}\log x}{x\sqrt{x}}\, dx$

[57] $\displaystyle\int_0^1 \frac{e^{\sin\frac{1}{x}}}{x\sqrt{x}}\, dx$

[58] $\displaystyle\int_0^{+\infty} \cos x\, e^{-x} \sin\frac{1}{\sqrt{x}}\, dx$

[59] $\displaystyle\int_0^{+\infty} \sin\left(e^{-x}\right)\, dx$

[60] $\displaystyle\int_{-\infty}^{+\infty} \frac{\log x^2}{1+x^2}\, dx$

[61] $\displaystyle\int_0^{\frac{\pi}{2}} \tan x \sqrt{\tan x}\, dx$

[62] $\displaystyle\int_{-\infty}^{+\infty} \frac{\pi}{2} - \arctan(e^x)\, dx$

[63] $\displaystyle\int_0^{+\infty} \left(\frac{x+100}{2x+1}\right)^x\, dx$

[64] $\displaystyle\int_0^{+\infty} \left(1 - \frac{1}{x}\right)^{x^2}\, dx$

[65] $\displaystyle\int_0^{+\infty} \left(\frac{3x+2}{2x+3}\right)^x\, dx$

[66] $\displaystyle\int_1^{+\infty} \left(\frac{1}{4}\arctan x\right)^{3x}\, dx$

[67] $\displaystyle\int_{-\infty}^0 \left(\arctan^2 x\right)^x\, dx$

[68] $\displaystyle\int_0^{+\infty} \left(\frac{2+\sin x}{5+\cos x}\right)^x\, dx$

[69] $\displaystyle\int_1^{+\infty} \left(\frac{2}{\pi}\arctan x\right)^{x^2}\, dx$