Mathematisches Institut
der Heinrich-Heine Universität
Düsseldorf
PD. Dr. Axel Grünrock

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Extra-Aufgaben

ÜBUNGEN ZUR ANALYSIS II

Berechnen Sie die folgenden unbestimmten Integrale:

(1) $\displaystyle\int \frac{(1-x)^3}{x\sqrt[3]{x}}\,dx$

(2) $\displaystyle\int \left(1-\frac{1}{x^2}\right)\sqrt{x\sqrt{x}}\,dx$

(3) $\displaystyle\int \frac{2^{x+1}-5^{x-1}}{10^x}\,dx$

(4) $\displaystyle\int \frac{e^{3x}+1}{e^x+1}\,dx$

Hinweis: $a^3+b^3=(a+b)(a^2-ab+b^2)$

(5) $\displaystyle\int \frac{x^2}{1+x^2}\,dx$

(6) $\displaystyle\int (2x-3)^{10}\,dx$

(7) $\displaystyle\int \frac{1}{\sqrt{2-5x}}\,dx$

(8) $\displaystyle\int \frac{\sqrt[5]{1-2x+x^2}}{1-x}\,dx$

(9) $\displaystyle\int \frac{e^x}{2+e^x}\,dx$

(10) $\displaystyle\int \frac{1}{1+e^{3x}}\,dx$

(11) $\displaystyle\int \frac{\sin(x)+\cos(x)}{\sqrt[3]{\sin(x)-\cos(x)}}\,dx$

(12) $\displaystyle\int \frac{\sin x}{\sqrt{-\cos(2x)}}\,dx$

Hinweis. $\cos(2x) = 2\cos^2(x) - 1$.

(13) $\displaystyle\int \frac{\arctan x}{1+x^2}\,dx$

(14) $\displaystyle\int \frac{x^2}{(1-x)^{100}}\,dx$

(15) $\displaystyle\int \frac{1}{\sqrt{x+1}+\sqrt{x-1}}\,dx$

(16) $\displaystyle\int \sin^5(x)\cos(x)\,dx$

(17) $\displaystyle\int \cos^3(x)\,dx$

(18) $\displaystyle\int \cos^4(x)\,dx$

Hinweis: Siehe Hinweis zu (12) oben.

(19) $\int \arctan x \, dx$

(20) $\int \arccos x \, dx$

(21) $\int x(\arctan x)^2 \, dx$

(22) $\int (\arcsin x)^2 \, dx$

(23) $\int x \ln\left(\frac{1+x}{1-x}\right) \, dx$

(24*) $\int x^2(\arccos x) \, dx$

(25*) $\int \arctan(\sqrt{x}) \, dx$

(26*) $\int \sin(x) \ln(\tan x) \, dx$