Cvičenie 3.4.2003

Parciálne zlomky, Integrovanie racionálnych funkcií, Určitý integrál

Parciálne zlomky, racionálne funkcie:

1. $\int \frac{dx}{x^2+2x}$ **2.** $\int \frac{dx}{x^2-1}$ **3.** $\int \frac{dx}{x^3+x}$ **4.** $\int \frac{dx}{(x-1)(x-2)(x-3)}$ **5.** $\int \frac{dx}{x(x+1)^2}$

6. $\int \frac{2x^2+41x-91}{(x-1)(x+3)(x-4)}dx$ **7.** $\int \frac{2dx}{x^2+2x+5}$ **8.** $\int \frac{dx}{3x^2+5}$ **9.** $\int \frac{dx}{x^3+1}$ **10.** $\int \frac{dx}{x^3+x^2+x}$

11. $\int \frac{x^2}{x^2-6x+10}dx$ **12.** $\int \frac{2x-3}{(x^2-3x+2)^2}dx$ **13.** $\int \frac{9x-14}{9x^2-24x+16}dx$ **14.** $\int \frac{dx}{2x^2+5x-12}$

15. $\int \frac{3x^2+32x-120}{(x-2)(x+2)(x-5)}dx$ **16.** $\int \frac{5x^3-15x^2+15x-3}{x^3-8x^2+17x-10}dx$ **17.** $\int \frac{5x^3+9x^2-22x-8}{x^3-4x}dx$ **18.** $\int \frac{x^3+x+1}{(x^2+1)^2}dx$

19. $\int \frac{2x^3-7x^2+12x-10}{x^4-4x^3+8x^2-8x+12}dx$ **20.** $\int \frac{9x^4+3x^3-23x^2+x}{9x^3-6x^2-5x+2}dx$

Určitý integrál:

21. $\int_1^2 (x^2-3x+2)\,dx$ **22.** $\int_0^3 |1-3x|\,dx$ **23.** $\int_{-4}^{-2} \frac{1}{x}dx$ **24.** $\int_0^1 \frac{dx}{1+x^2}$ **25.** $\int_0^2 \frac{x}{x^2+3x+2}dx$

26. $\int_0^\pi \cos x\,dx$ **27.** $\int_0^\pi |\cos x|\,dx$ **28.** $\int_0^\pi \sin^3 x\,dx$ **29.** $\int_3^7 \frac{x}{x^2-4}dx$ **30.** $\int_0^{\frac{\pi}{2}} \cos x \cdot \sin^2 x\,dx$

31. $\int_0^1 \frac{\sqrt{x}}{1+\sqrt{x}}\,dx$ **32.** $\int_{-1}^1 \frac{dx}{(1+x^2)^2}$ **33.** $\int_0^{\sqrt{2}} \sqrt{4-x^2}\,dx$ **34.** $\int_0^{\ln 5} \frac{e^x\sqrt{e^x-1}}{e^x+3}\,dx$ **35.** $\int_1^2 \frac{dx}{\sqrt{3+2x-x^2}}$

36. $\int_0^{\frac{\pi}{2}} \frac{\sin \varphi}{6-5\cos\varphi+\cos^2\varphi}d\varphi$ **37.** $\int_0^1 xe^{-x}dx$ **38.** $\int_1^e \ln x\,dx$ **39.** $\int_0^{\frac{\pi}{2}} x\sin x\,dx$ **40.** $\int_1^2 x\ln x\,dx$

41. $\int_0^1 x^3 e^{2x}dx$ **42.** $\int_0^{\frac{\pi}{2}} e^{2x}\sin x\,dx$ **43.** $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} x\sin^{-2} x\,dx$ **44.** $\int_{-1}^1 \arccos x\,dx$

45. $\int_0^{\sqrt{3}} x\,\mathrm{arctg}\,x\,dx$ **46.** $\int_0^{\ln 2} x\cosh x\,dx$ **47.** $I_n = \int_0^{\frac{\pi}{2}} \sin^n x\,dx$