

ANALIZA 1
21. domača naloga

(1) Izračunaj naslednje integrale

(a) $\int (\sqrt{x} + 1)(x - \sqrt{x} + 1) dx$	(b) $\int \left(3^{4-5x} + \frac{e^{a/x}}{x^2} \right) dx$	(c) $\int \frac{1}{3x - \sqrt{x}} dx$
(d) $\int e^x \sqrt{a - be^x} dx$	(e) $\int \frac{dx}{\sqrt{(1+x^2) \ln(x + \sqrt{1+x^2})}}$	(f) $\int \operatorname{tg}^3 x dx$
(g) $\int \frac{1}{x^{5/4} - x^{3/4}} dx$	(h) $\int \frac{\sqrt{2+x^2} - \sqrt{2-x^2}}{\sqrt{4-x^4}} dx$	(i) $\int \frac{x}{\sqrt{a^2 - x^2}} dx$
(j) $\int e^{3-x^2} x dx$	(k) $\int \frac{1-3x}{3+2x} dx$	(l) $\int x \ln \frac{2-x}{2+x} dx$
(m) $\int \frac{\sqrt{x} + \ln x}{x} dx$	(n) $\int \frac{e^{\operatorname{arctg} x} + x \ln(1+x^2) + 1}{1+x^2} dx$	(o) $\int \frac{x \cos x}{\sin^2 x} dx$
(p) $\int \sqrt{\frac{\arcsin x}{1-x^2}} dx$	(q) $\int \arcsin x dx$	(r) $\int \frac{x - \operatorname{arctg}^3 2x}{1+4x^2} dx$

(a) $\frac{2}{5}x^{5/2} + x + C$	(b) $C - \frac{3^{4-5x}}{5 \ln 3} - \frac{1}{a}e^{a/x}$	(c) $\frac{2}{3} \ln 3\sqrt{x} - 1 + C$
(d) $C - \frac{2}{3b}(a - be^x)^{3/2}$	(e) $2\sqrt{\ln(x + \sqrt{1+x^2})} + C$	(f) $\frac{1}{2 \cos^2 x} + \ln \cos x + C$
(g) $2 \ln \left \frac{\sqrt[4]{x}-1}{\sqrt[4]{x}+1} \right + C$	(h) $\arcsin \frac{x}{\sqrt{2}} - \ln(x + \sqrt{2+x^2}) + C$	(i) $C - \sqrt{a^2 - x^2}$
(j) $C - \frac{1}{2}e^{3-x^2}$	(k) $-\frac{3}{2}x + \frac{11}{4} \ln 3+2x + C$	(l) $\frac{x^2}{2} \ln \frac{2-x}{2+x} - 2x + 2 \ln \left \frac{x+2}{x-2} \right + C$
(m) $2\sqrt{x} + \frac{1}{2} \ln^2 x + C$	(n) $e^{\operatorname{arctg} x} + \operatorname{arctg} x + \frac{1}{4} \ln^2(1+x^2) + C$	(o) $-\frac{x}{\sin x} + \frac{1}{2} \ln \frac{1-\cos x}{1+\cos x} + C$
(p) $\frac{2}{3}(\arcsin x)^{3/2} + C$	(q) $x \arcsin x + \sqrt{1-x^2} + C$	(r) $\frac{1}{8} \ln(1+4x^2) - \frac{1}{8} \operatorname{arctg}^4(2x) + C$

(2) (a) Naj bo f zvezno odvedljiva funkcija in C realno število. Dokaži enakost

$$\int (f(x) + f'(x)) e^x dx = f(x) e^x + C.$$

(b) S pomočjo točke (a) izračunaj integral

$$\int \frac{x}{(1+x)^2} e^x dx.$$

Integral je $\frac{e^x}{1+x} + C$.
