

 TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGABIENSE	KATEDRA ZA ZAJEDNIČKE PREDMETE	Matematika 2 (preddiplomski stručni studij elektrotehnike)	Zadaci za demonstrature 21.3.2017.
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1. Odredite sljedeće neodređene integrale:

a) $\int \sin^5 x \cdot \cos^8 x \cdot dx;$

b) $\int \sin^6 y \cdot \cos^5 y \cdot dy;$

c) $\int \operatorname{ctg}^3 t \cdot dt.$

2. Odredite sljedeće neodređene integrale:

a) $\int \operatorname{sh}^5 w \cdot \operatorname{ch}^{12} w \cdot dw;$

b) $\int \operatorname{sh}^{10} q \cdot \operatorname{ch}^5 q \cdot dq;$

c) $\int \operatorname{cth}^3 u \cdot du.$

3. Odredite sljedeće neodređene integrale:

a) $\int \frac{\cos x}{\sin^2 x + \sin x} \cdot dx;$

b) $\int \frac{2 \cdot \sin y}{2 \cdot \cos y - \cos^2 y} \cdot dy;$

c) $\int \frac{4 \cdot \sin(2 \cdot t)}{\sin^2 t - 6 \cdot \sin t - 7} \cdot dt.$

4. Odredite sljedeće neodređene integrale:

a) $\int 2 \cdot \sqrt{1 + \operatorname{ch}^2 q} \cdot \operatorname{sh} q \cdot dq;$

b) $\int 2 \cdot \sqrt{10 \cdot \operatorname{sh} u - \operatorname{sh}^2 u} \cdot \operatorname{ch} u \cdot du;$

c) $\int \frac{2 \cdot \operatorname{sh} w}{\sqrt{4 \cdot \operatorname{ch}^2 w + 4 \cdot \operatorname{ch} w - 3}} \cdot dw;$

d) $\int \frac{4 \cdot \operatorname{ch} v}{\sqrt{8 \cdot \operatorname{sh} v - 3 - 16 \cdot \operatorname{sh}^2 v}} \cdot dv.$

REZULTATI ZADATAKA

Napomena: U svim rezultatima zadataka je $C \in \mathbb{R}$ konstanta.

1. a) $-\frac{1}{13} \cdot \cos^{13} x + \frac{2}{11} \cdot \cos^{11} x - \frac{1}{9} \cdot \cos^9 x + C$;
 b) $\frac{1}{11} \cdot \sin^{11} y - \frac{2}{9} \cdot \sin^9 y + \frac{1}{7} \cdot \sin^7 y + C$;
 c) $-\ln|\sin t| - \frac{1}{2 \cdot \sin^2 t} + C$.

2. a) $\frac{1}{17} \cdot \operatorname{ch}^{17} w - \frac{2}{15} \cdot \operatorname{ch}^{15} w + \frac{1}{13} \cdot \operatorname{ch}^{13} w + C$;
 b) $\frac{1}{15} \cdot \operatorname{sh}^{15} q + \frac{2}{13} \cdot \operatorname{sh}^{13} q + \frac{1}{11} \cdot \operatorname{sh}^{11} q + C$;
 c) $\ln|\operatorname{sh} u| - \frac{1}{2 \cdot \operatorname{sh}^2 u} + C$.

3. a) $\ln \left| \frac{\sin x}{1 + \sin x} \right| + C$;
 b) $\ln \left| \frac{\cos y - 2}{\cos y} \right| + C$;
 c) $7 \cdot \ln(7 - \sin t) + \ln(\sin t + 1) + C$.

4. a) $\operatorname{ch} q \cdot \sqrt{1 + \operatorname{ch}^2 q} + \ln \left(\operatorname{ch} q + \sqrt{1 + \operatorname{ch}^2 q} \right) + C$;
 b) $(\operatorname{sh} u - 5) \cdot \sqrt{10 \cdot \operatorname{sh} u - \operatorname{sh}^2 u} + 25 \cdot \arcsin \left(\frac{\operatorname{sh} u - 5}{5} \right) + C$;
 c) $\ln \left| 2 \cdot \operatorname{ch} w - 1 + \sqrt{4 \cdot \operatorname{ch} w^2 + 4 \cdot \operatorname{ch} w - 3} \right| + C$;
 d) $\arcsin \left(\frac{4 \cdot \operatorname{sh} v - 1}{2} \right) + C$.