Formule za tretji kolokvij iz Matematike 1

TABELA ODVODOV IN INTEGRALOV

Funkcija	Odvod	Nedoločeni integrali
$f(x) = x^n$	$f'(x) = nx^{n-1}$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C, n \neq -1$
$f(x) = \cos x$	$f'(x) = -\sin x$	$\int \frac{dx}{x} = \ln\lvert x\rvert + C$
$f(x) = \sin x$	$f'(x) = \cos x$	$\int e^x dx = e^x + C$
$f(x) = \operatorname{tg} x$	$f'(x) = \frac{1}{(\cos x)^2}$	$\int \cos x dx = \sin x + C$
$f(x) = \operatorname{ctg} x$	$f'(x) = -\frac{1}{(\sin x)^2}$	$\int \sin x dx = -\cos x + C$
$f(x) = e^x$	$f'(x) = e^x$	$\int \operatorname{ch} x dx = \operatorname{sh} x + C$
$f(x) = \ln x$	$f'(x) = \frac{1}{x}$	$\int \operatorname{sh} x dx = \operatorname{ch} x + C$
$f(x) = \arcsin x$	$f'(x) = \frac{1}{\sqrt{1-x^2}}$	$\int \frac{dx}{\sqrt{1-x^2}} = \arcsin x + C$
$f(x) = \operatorname{arctg} x$	$f'(x) = \frac{1}{1+x^2}$	$\int \frac{dx}{1+x^2} = \operatorname{arctg} x + C$

DOLOČENI INTEGRALI

$S = \int_a^b (g(x) - f(x))dx$	ploščina lika med krivuljama
$x^* = \frac{\int_a^b x(g(x)-f(x))dx}{S}$, $y^* = \frac{\frac{1}{2}\int_a^b (g(x)^2-f(x)^2)dx}{S}$	središče lika
$V = \pi \int_a^b f(x)^2 dx$	prostornina vrtenine okoli osi x
$P = 2\pi \int_a^b f(x)\sqrt{1+f'(x)^2}dx$	površina vrtenine okoli osi x
$l = \int_a^b \sqrt{1+f'(x)^2}dx$	dolžina krivulje

VEKTORJI

$\vec{a} \cdot \vec{b} = a_1 b_1 + a_2 b_2 + a_3 b_3$	skalarni produkt
$\lVert a \rVert = \sqrt{\vec{a} \cdot \vec{a}}$	velikost vektorja
$\vec{a} \cdot \vec{b} = \lVert\vec{a}\rVert \lVert\vec{b}\rVert \cos\phi$	kosinusni izrek
$\vec{a} \times \vec{b} = (a_2 b_3 - a_3 b_2, a_3 b_1 - a_1 b_3, a_1 b_2 - a_2 b_1)$	vektorski produkt

PREMICE IN RAVNINE

$\vec{r}_T = \vec{r}_A + t\vec{s}$	enačba premice
$(\vec{r}_T - \vec{r}_A) \cdot \vec{n} = 0$	enačba ravnine
$\mathrm{pr}_p(T) = \vec{r}_A + \frac{\lVert(\vec{r}_T - \vec{r}_A)\cdot\vec{s}\rVert}{\lVert\vec{s}\rVert^2}\vec{s}$	projekcija točke na premico
$y = ax + b, a = \frac{\overline{xy} - \overline{x}\cdot\overline{y}}{\overline{x^2} - \overline{x}^2}, b = \frac{\overline{x^2}\cdot\overline{y} - \overline{xy}\cdot\overline{x}}{\overline{x^2} - \overline{x}^2}$	regresijska premica

$$\overline{xy} = \frac{1}{n}\sum_{i=1}^{n} x_i y_i, \quad \overline{x} = \frac{1}{n}\sum_{i=1}^{n} x_i, \quad \overline{y} = \frac{1}{n}\sum_{i=1}^{n} y_i, \quad \overline{x^2} = \frac{1}{n}\sum_{i=1}^{n} {x_i}^2.$$