OPERACE VEKTOROVÉ ANALÝZY

Název Symbol	Soustava kartézských souřadnic x, y, z	Soustava válcových (cylindrických) souřadnic r, α, z	Soustava kulových souřadnic r, α, ϑ. r má jiný význam než v cylindrickém systému.
vektor $\boldsymbol{a}$	$\boldsymbol{a}=\boldsymbol{i}\,a_x+\boldsymbol{j}\,a_y+\boldsymbol{k}\,a_z$ $\boldsymbol{a}=(a_x,a_y,a_z)$	$\boldsymbol{a}=\boldsymbol{r}_0\,a_r+\boldsymbol{\alpha}_0\,a_\alpha+\boldsymbol{k}\,a_z$ $\boldsymbol{a}=(a_r,a_\alpha,a_z)$	$\boldsymbol{a}=\boldsymbol{r}_0\,a_r+\boldsymbol{\alpha}_0\,a_{\boldsymbol{\alpha}}+\vartheta_0\,a_\vartheta$ $\boldsymbol{a}=(a_r,a_\alpha,a_\vartheta)$
Hamiltonův operátor ∇	$\boldsymbol{i}\frac{\partial}{\partial x}+\boldsymbol{j}\frac{\partial}{\partial y}+\boldsymbol{k}\frac{\partial}{\partial z}$	$\boldsymbol{r}_0\frac{\partial}{\partial r}+\boldsymbol{\alpha}_0\frac{1}{r}\frac{\partial}{\partial\alpha}+\boldsymbol{k}\frac{\partial}{\partial z}$	$\boldsymbol{r}_0\frac{\partial}{\partial r}+\boldsymbol{\alpha}_0\frac{1}{r\sin\vartheta}\frac{\partial}{\partial\alpha}+\vartheta_0\frac{1}{r}\frac{\partial}{\partial\vartheta}$
grad$\varphi=\nabla\varphi$	$\boldsymbol{i}\frac{\partial\varphi}{\partial x}+\boldsymbol{j}\frac{\partial\varphi}{\partial y}+\boldsymbol{k}\frac{\partial\varphi}{\partial z}$	$\boldsymbol{r}_0\frac{\partial\varphi}{\partial r}+\boldsymbol{\alpha}_0\frac{1}{r}\frac{\partial\varphi}{\partial\alpha}+\boldsymbol{k}\frac{\partial\varphi}{\partial z}$	$\boldsymbol{r}_0\frac{\partial\varphi}{\partial r}+\boldsymbol{\alpha}_0\frac{1}{r\sin\vartheta}\frac{\partial\varphi}{\partial\alpha}+\vartheta_0\frac{1}{r}\frac{\partial\varphi}{\partial\vartheta}$
div $\boldsymbol{a}=\nabla\,\boldsymbol{a}$	$\frac{\partial a_x}{\partial x}+\frac{\partial a_y}{\partial y}+\frac{\partial a_z}{\partial z}$	$\frac{\partial}{\partial r}(r\,a_r)+\frac{1}{r}\frac{\partial a_\alpha}{\partial\alpha}+\frac{\partial a_z}{\partial z}$	$\frac{1}{r^2}\frac{\partial(r^2a_r)}{\partial r}+\frac{1}{r\sin\vartheta}\left[\frac{\partial}{\partial\vartheta}(a_\vartheta\sin\vartheta)+\frac{\partial a_\alpha}{\partial\alpha}\right]$
rot $\boldsymbol{a}=\nabla\times\boldsymbol{a}$	$\text{rot}_x\boldsymbol{a}=\frac{\partial a_z}{\partial y}-\frac{\partial a_y}{\partial z}$ $\text{rot}_y\boldsymbol{a}=\frac{\partial a_x}{\partial z}-\frac{\partial a_z}{\partial x}$ $\text{rot}_z\boldsymbol{a}=\frac{\partial a_y}{\partial x}-\frac{\partial a_x}{\partial y}$	$\text{rot}_r\boldsymbol{a}=\frac{1}{r}\frac{\partial a_z}{\partial\alpha}-\frac{\partial a_\alpha}{\partial z}$ $\text{rot}_\alpha\boldsymbol{a}=\frac{\partial a_r}{\partial z}-\frac{\partial a_z}{\partial r}$ $\text{rot}_z\boldsymbol{a}=\frac{1}{r}\frac{\partial(ra_\alpha)}{\partial r}-\frac{1}{r}\frac{\partial a_r}{\partial\alpha}$	$\text{rot}_r\boldsymbol{a}=\frac{1}{r\sin\vartheta}\left[\frac{\partial}{\partial\vartheta}(a_\alpha\sin\vartheta)-\frac{\partial a_\vartheta}{\partial\alpha}\right]$ $\text{rot}_\alpha\boldsymbol{a}=\frac{1}{r}\frac{\partial}{\partial r}(ra_\vartheta)-\frac{1}{r}\frac{\partial a_r}{\partial\vartheta}$ $\text{rot}_\vartheta\boldsymbol{a}=\frac{1}{r\sin\vartheta}\frac{\partial a_r}{\partial\alpha}-\frac{1}{r}\frac{\partial}{\partial r}(ra_\alpha)$
Laplaceův operátor	$\Delta\varphi=\frac{\partial^2\varphi}{\partial x^2}+\frac{\partial^2\varphi}{\partial y^2}+\frac{\partial^2\varphi}{\partial z^2}$	$\Delta\varphi=\frac{1}{r}\frac{\partial}{\partial r}\left(r\frac{\partial\varphi}{\partial r}\right)+\frac{1}{r^2}\frac{\partial^2\varphi}{\partial\alpha^2}+\frac{\partial^2\varphi}{\partial z^2}$	$\Delta\varphi=\frac{1}{r^2}\left[\frac{\partial}{\partial r}\left(r^2\frac{\partial\varphi}{\partial r}\right)+\frac{1}{\sin\vartheta}\frac{\partial}{\partial\vartheta}\left(\sin\vartheta\frac{\partial\varphi}{\partial\vartheta}\right)+\frac{1}{\sin^2\vartheta}\frac{\partial^2\varphi}{\partial\alpha^2}\right]$
Dif. rovnice vektor. čar pole $\boldsymbol{a}$	$\frac{dx}{a_x}=\frac{dy}{a_y}=\frac{dz}{a_z}$	$\frac{dr}{a_r}=\frac{rd\alpha}{a_\alpha}=\frac{dz}{a_z}$	$\frac{dr}{a_r}=\frac{rd\vartheta}{a_\vartheta}=\frac{r\sin\vartheta\,d\alpha}{a_\alpha}$