

Formelliste

Andrederiverttesten for funksjoner av to variabler er basert på

$$\Delta = f_{xx}f_{yy} - f_{xy}^2$$

Sylinderkoordinater (r, θ, z)

$$\begin{aligned} x &= r \cos(\theta), \\ y &= r \sin(\theta), & r^2 &= x^2 + y^2, & dV &= r dr dz d\theta \\ z &= z, \end{aligned}$$

Kulekoordinater (ρ, φ, θ)

$$\begin{aligned} x &= \rho \sin(\varphi) \cos(\theta), \\ y &= \rho \sin(\varphi) \sin(\theta), & \rho^2 &= x^2 + y^2 + z^2, & dV &= \rho^2 \sin(\varphi) d\rho d\varphi d\theta \\ z &= \rho \cos(\varphi), \end{aligned}$$

Variabelskifte

$$dx dy = \left| \frac{\partial(x, y)}{\partial(u, v)} \right| du dv, \quad \text{der} \quad \frac{\partial(x, y)}{\partial(u, v)} = \begin{vmatrix} \frac{\partial x}{\partial u} & \frac{\partial x}{\partial v} \\ \frac{\partial y}{\partial u} & \frac{\partial y}{\partial v} \end{vmatrix},$$

og tilsvarende for flere variabler

Flateintegral

$$dS = \left| \frac{\partial \mathbf{r}}{\partial u} \times \frac{\partial \mathbf{r}}{\partial v} \right| du dv, \quad \text{eller} \quad dS = \frac{|\nabla G|}{|G_z|} dx dy$$

Greens teorem

$$\oint_C (F_1 dx + F_2 dy) = \iint_R \left(\frac{\partial F_2}{\partial x} - \frac{\partial F_1}{\partial y} \right) dA$$

Divergensteoremet

$$\oiint_S \mathbf{F} \cdot \hat{\mathbf{N}} dS = \iiint_T \operatorname{div} \mathbf{F} dV$$

Stokes' teorem

$$\oint_C \mathbf{F} \cdot d\mathbf{r} = \iint_S (\operatorname{curl} \mathbf{F}) \cdot \hat{\mathbf{N}} dS$$