Dermed:

$$\left.\begin{aligned} \oint_S \vec{E}\cdot d\vec{A} &= \int_V (\nabla\cdot\vec{E})\,dV \\ \text{Gauss' } \| \text{ lov} \quad & \qquad \| \\ \frac{1}{\varepsilon_0}\, q &= \frac{1}{\varepsilon_0}\int_V \rho\, dV \end{aligned}\right\} \Rightarrow \boxed{\nabla\cdot\vec{E} = \rho/\varepsilon_0}$$

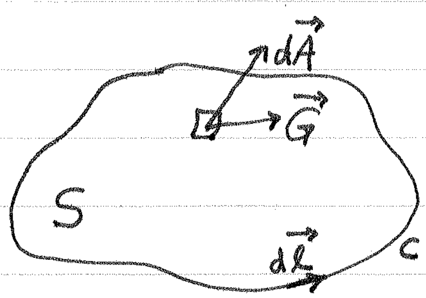
Gauss' lov på differensialform

Merk: <u>Integrandene</u> må være like overalt (ikke bare integralene) fordi $S$ og $V$ er vilkårlige

Videre:

$$\left.\begin{aligned} \oint_S \vec{B}\cdot d\vec{A} &= \int_V (\nabla\cdot\vec{B})\,dV \\ \text{Gauss' } \| \text{ lov} \quad & \qquad \| \\ 0 &= 0 \end{aligned}\right\} \Rightarrow \boxed{\nabla\cdot\vec{B} = 0}$$

Stokes' teorem: $\oint_C \vec{G}\cdot d\vec{\ell} = \int_S (\nabla\times\vec{G})\cdot d\vec{A}$




$$\nabla\times\vec{G} = \hat{x}\left(\frac{\partial G_z}{\partial y} - \frac{\partial G_y}{\partial z}\right) + \hat{y}\left(\frac{\partial G_x}{\partial z} - \frac{\partial G_z}{\partial x}\right) + \hat{z}\left(\frac{\partial G_y}{\partial x} - \frac{\partial G_x}{\partial y}\right)$$

$= \text{curl til } \vec{G}$

$\nabla\times\vec{G}$ er en <u>vektor</u>