Formler og konvensjoner

$$\begin{array}{rclclcl}
x & = & r\cos(\theta) & = & \varrho\cos(\theta)\sin(\varphi), & & 0 \le r, \varrho \\
y & = & r\sin(\theta) & = & \varrho\sin(\theta)\sin(\varphi), & & 0 \le \theta < 2\pi \\
z & = & z & = & \varrho\cos(\varphi), & & 0 \le \varphi \le \pi.
\end{array}$$

$$\mathrm{d}s = |\gamma'(t)|\mathrm{d}t$$

$$\mathrm{d}A = \mathrm{d}x\,\mathrm{d}y = r\,\mathrm{d}r\,\mathrm{d}\theta$$

$$\mathrm{d}\sigma = |\mathbf{r}_s \times \mathbf{r}_t|\,\mathrm{d}s\,\mathrm{d}t$$

$$(\mathrm{d}\sigma = |(z_x, z_y, -1)|\,\mathrm{d}x\,\mathrm{d}y \quad \text{for} \quad z = z(x,y))$$

$$\mathrm{d}V = \mathrm{d}x\,\mathrm{d}y\,\mathrm{d}z = r\,\mathrm{d}r\,\mathrm{d}\theta\,\mathrm{d}z = \varrho^2\sin(\varphi)\,\mathrm{d}\varrho\,\mathrm{d}\varphi\,\mathrm{d}\theta$$

$$\mathrm{d}\mathbf{r} = \gamma'(s)\,\mathrm{d}s = \mathbf{T}\,\mathrm{d}s = \frac{\gamma'(t)}{|\gamma'(t)|}|\gamma'(t)|\,\mathrm{d}t$$

$$\mathrm{curl}(\mathbf{F}) = \nabla \times \mathbf{F} = \left(\tfrac{\partial F_3}{\partial x_2} - \tfrac{\partial F_2}{\partial x_3}, \tfrac{\partial F_1}{\partial x_3} - \tfrac{\partial F_3}{\partial x_1}, \tfrac{\partial F_2}{\partial x_1} - \tfrac{\partial F_1}{\partial x_2}\right)$$

$$\iint_D \left(\tfrac{\partial Q}{\partial x} - \tfrac{\partial P}{\partial y}\right)\mathrm{d}A = \int_{\partial A} P\,\mathrm{d}x + Q\,\mathrm{d}y$$

$$\iint_{\partial V} \mathbf{F}\cdot\mathbf{N}\,\mathrm{d}\sigma = \iiint_V \mathrm{div}(\mathbf{F})\,\mathrm{d}V$$

$$\int_{\partial S} \mathbf{F}\cdot\mathbf{T}\,\mathrm{d}s = \iint_S \mathrm{curl}(\mathbf{F})\cdot\mathbf{N}\,\mathrm{d}\sigma$$