# FORMELLISTE

**Dekomponering av akselerasjonsvektor:**

$$\mathbf{a}(t) = v'(t)\,\mathbf{T}(t) + \kappa(t)v^2(t)\,\mathbf{N}(t)$$

**Diskriminanten i annenderiverttesten:**

$$\Delta = AC - B^2 \quad \text{der} \quad A = f_{xx},\ B = f_{xy},\ C = f_{yy}$$

**Koordinatsystemer:**

Sylinderkoordinater $(r, \theta, z)$:

$$x = r\,\cos\theta, \quad y = r\,\sin\theta, \quad z = z,$$
$$r^2 = x^2 + y^2, \quad dV = r\,dz\,dr\,d\theta$$

Kulekoordinater $(\rho,\ \varphi,\ \theta)$:

$$x = \rho\,\sin\varphi\cos\theta, \quad y = \rho\,\sin\varphi\sin\theta, \quad z = \rho\,\cos\varphi,$$
$$\rho^2 = x^2 + y^2 + z^2, \quad dV = \rho^2\sin\varphi\,d\rho\,d\varphi\,d\theta$$

**Flateintegral:**

$$dS = |\mathbf{N}(u,v)|\,du\,dv = \left| \frac{\partial \mathbf{r}}{\partial u} \times \frac{\partial \mathbf{r}}{\partial v} \right|\,du\,dv$$

**Tyngdepunkt for romlige legemer:**

$$\overline{x} = \frac{1}{m}\iiint_T x\,dm, \quad \overline{y} = \frac{1}{m}\iiint_T y\,dm, \quad \overline{z} = \frac{1}{m}\iiint_T z\,dm$$

**Vektoranalyse:**

Greens teorem: $\displaystyle \oint_C P\,dx + Q\,dy = \iint_R \left( \frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dA$

Divergensteoremet: $\displaystyle \iint_S \mathbf{F} \cdot \mathbf{n}\,dS = \iiint_T \operatorname{div}\mathbf{F}\,dV$

Stokes' teorem: $\displaystyle \oint_C \mathbf{F} \cdot \mathbf{T}\,ds = \iint_S (\operatorname{curl}\mathbf{F}) \cdot \mathbf{n}\,dS$