Stokes' Theorem

Let $\vec{F}(x,y,z)$ be a vector field, and S a surface with boundary curve C (with positive orientation). Then

$$\oint_C \vec{F}\cdot d\vec{r} = \iint_S \operatorname{curl}(\vec{F})\cdot d\vec{S} = \iint_S (\nabla\times\vec{F})\cdot d\vec{S}$$

The Divergence Theorem

Let E be a 3-dimensional region, and S the boundary of E (with outward orientation). Then for any vector field $\vec{F}(x,y,z)$,

$$\iint_S \vec{F}\cdot d\vec{S} = \iiint_E \operatorname{div}(\vec{F})\,dV = \iiint_E (\nabla\cdot\vec{F})\,dV$$