§34

Recall, if $\vec{F}: \mathbb{R}^3 \to \mathbb{R}^3$, then $\operatorname{curl} \vec{F}: \mathbb{R}^3 \to \mathbb{R}^3$

is $\operatorname{curl} \vec{F} = \left(\frac{\partial F_3}{\partial y} - \frac{\partial F_2}{\partial z}, \frac{\partial F_1}{\partial z} - \frac{\partial F_3}{\partial x}, \frac{\partial F_2}{\partial x} - \frac{\partial F_1}{\partial y} \right)$.

Stokes's Theorem

- Σ a closed, bounded, two-sided surface in $\mathbb{R}^3$ with a simple closed curve C as its boundary.
- $\vec{n}$ a continuous unit normal for Σ.
- C oriented in direction of forward movement if your head is at $\vec{n}$ and Σ is on your left.
- $\vec{F}: \mathbb{R}^3 \to \mathbb{R}^3$ a vector field.

$$\oint_C F_1\,dx + F_2\,dy + F_3\,dz = \iint_\Sigma \operatorname{curl} \vec{F} \cdot \vec{n}\, dS$$