

Final Exam Notes

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Divergence Theorem

In 2 dimensions, divergence theorem is

$$\iint_T \nabla \cdot \vec{F} dV = \int_{\partial T} \vec{F} \cdot \vec{n} ds$$

And in 3 dimensions,

$$\iiint_R \operatorname{div} \vec{F} dV = \iint_{\partial R} \vec{F} \cdot \vec{n} dS$$

In this scenario, the ∂ symbol next to a set denotes the boundaries of a set. Also, the normal vectors represent the outward orientation of the unit vector.

Stoke's Theorem

Definition:

The flux of curl F across a surface S can be found with only information about the values of F along the boundary of S . Also, we can calculate the

$$\iint_S (\nabla \times \vec{F}) \cdot \vec{n} \, dS = \int_{\partial S} \vec{F} \cdot d\vec{r}$$