

# Sample LaTeX Document

Your Name

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## 1 Question to AI

Good morning. Could You please show me the Green Gauss integration formula for a scalar field in the plane  $(x,y)$ ,  $f:(x,y) \rightarrow \mathbb{R}$ , on a square chain  $[a,b] \times [c,d]$ ,  $f$  is  $C^1$  on  $\mathbb{R}^2$

## 2 Answer from AI

$$\int_a^b \int_c^d \left( \frac{\partial P}{\partial x} + \frac{\partial Q}{\partial y} \right) dx dy = \int_{\partial R} (P dx + Q dy)$$

Where: -  $R = [a, b] \times [c, d]$  is the square domain. -  $\partial R$  is the closed boundary of  $R$ , oriented positively (counterclockwise). -  $P(x, y)$  and  $Q(x, y)$  are components of a vector field  $\mathbf{F} = (P, Q)$ .

This formula essentially relates the integral of the divergence of  $\mathbf{F}$  over  $R$  to the line integral of  $\mathbf{F}$  along the boundary  $\partial R$ . In your case, the scalar field  $f(x, y)$  can be substituted appropriately into the formula to analyze its behavior on the given domain.

Let me know if you'd like further clarification or examples!