Problems: Surface Independence

Suppose that $\mathbf{F} = \nabla \times \mathbf{G}$, where the components of $\mathbf{G}$ have continuous second partial derivatives. Suppose also that $S$ is a closed, positively-oriented surface divided into two parts by a closed curve $C$. Apply Stokes’ theorem to show that $\int_S \mathbf{F} \cdot \mathbf{n} \, dS = 0$. 