Let $S$ be the surface of the box with sides of length 2 with opposite vertices at $(0, 0, 0)$ and $(2, 2, 2)$ and no ‘top.’ Normal vectors point outward. Evaluate

$$\int\int_S \text{curl}(\mathbf{F}) \cdot d\mathbf{S}$$

where $\mathbf{F} = \langle -xy, xy, xy^2z^{2016} + 2016x^2 + y^2 + z^2 \rangle$.

1. [5] Use Stokes’ Theorem to evaluate the integral as a line integral around the boundary.

2. [5] Use Stokes’ Theorem to evaluate the integral as a surface integral over the ‘top,’ i.e. deform the surface into an easier one with the same boundary.