

Problems: Flux Through General Surfaces

1. Let $\mathbf{F} = -y\mathbf{i} + x\mathbf{k}$ and let S be the graph of $z = x^2 + y^2$ above the unit square in the xy -plane. Find the *upward flux* of \mathbf{F} through S .
2. Let $\mathbf{F} = -y\mathbf{i} + x\mathbf{k}$ and let S be the graph of $z = x^2 + y$ above the square with vertices at $(0, 0, 0)$, $(2, 0, 0)$, $(2, 2, 0)$ and $(0, 2, 0)$. Find the upward flux of \mathbf{F} through S .

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