

Problems: Flux Through a Paraboloid

Consider the paraboloid $z = x^2 + y^2$. Let S be the portion of this surface that lies below the plane $z = 1$. Let $\mathbf{F} = x\mathbf{i} + y\mathbf{j} + (1 - 2z)\mathbf{k}$.

Calculate the flux of \mathbf{F} across S using the outward normal (the normal pointing away from the z -axis).

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