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Mathematics 206a: Multivariable Calculus
Fall Semester 2005
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Quiz #30
November 11

Let $\mathbf{f} : R \subset \mathfrak{R}^2 \rightarrow \mathfrak{R}^3$ be defined by $\mathbf{f}(s, t) = (s, t, 2s - 1)$ with $R = [0, 1] \times [0, 2]$.

Let M be the smooth surface parametrized by \mathbf{f} .

Let $\mathbf{F} : \mathfrak{R}^3 \rightarrow \mathfrak{R}^3$ be a vector field with $\mathbf{F}(x, y, z) = x^2\mathbf{i} + y^2\mathbf{j} + z^2\mathbf{k}$.

Calculate the value of the surface integral $\iint_M \mathbf{F} \cdot \mathbf{n} d\sigma$.