$\diamondsuit\heartsuit$ Flux of a Vector Field $\heartsuit\diamondsuit$

Example 1: Compute the flux of the vector field $\vec{F}(x, y, z) = x\vec{i} + y\vec{j} + 0\vec{k}$ over the portion of the paraboloid $z = x^2 + y^2$ below $z = 4$ (oriented with upward-pointing normal vectors).