

1. Evaluate the surface integral for the given vector field F and oriented surface S .

$$F(x, y, z) = \langle xy, yz, zx \rangle$$

And S is the part of the paraboloid $z = x^2 - y^2$ that lies above the square $0 \leq x \leq 1$, $0 \leq y \leq 1$

And has upward orientation.

Convert $F(x, y, z)$ into cylindrical coordinates

Find r_{θ} and r_r

Take the cross product of r_{θ} and r_r

And then take the absolute value

That will give u the value of dS

Convert to iterated integral and then solve

I understand the process of doing this problem int theory

But have trouble understanding how to actually do it.