

Quiz for lecture 24

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Section: 23

By using Stoke's theorem, or otherwise, evaluate $\int_C F \cdot dr$,

where $F(x, y, z) = (yz + 2y + 3z)i + (xz + 2x + 4z)j + (xy + 3x + 4y)k$

where C is the curve of intersection of the plane $x + y + z = 1$.

and the cylinder $x^2 + y^2 = 1$, oriented counterclockwise as viewed from above. Be sure to explain everything.

$$\begin{aligned}\text{curl } F &= i(x+4 - x-4) - j(y+3 - y-3) + k(z+2 - z-2) \\ &= 0.\end{aligned}$$

$$\begin{aligned}\int_C F \cdot dr &= \int_S \text{curl } F \cdot ds \\ &= \int_S 0 \cdot ds \\ &= 0.\end{aligned}$$

