"QUIZ" for Lecture 24

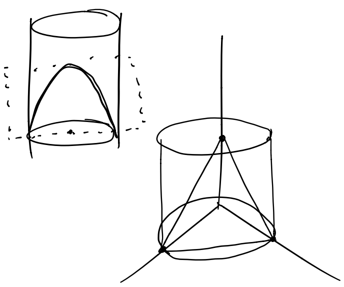
NAME: (print!) Jennifer Gonzalez **Section:** 23

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q24FirstLast.pdf) ASAP BUT NO LATER THAN Dec. 4, 2020, 8:00pm

By using Stokes' Theorem, or otherwise, evaluate $\int_C \mathbf{F} \cdot d\mathbf{r}$, where

$$F(x, y, z) = (yz + 2y + 3z)\mathbf{i} + (xz + 2x + 4z)\mathbf{j} + (xy + 3x + 4y)\mathbf{k} \quad ,$$

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.



Curl:

$$\begin{matrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ yz+2y+3z & xz+2x+4z & xy+3x+4y \end{matrix}$$

$= ((x+4)-(x+4))i - ((y+3)-(y+3))j + ((z+2)-(z+2))$

$= \langle 0,0,0 \rangle$

since the curl is 0 $\int_C F \cdot dr = 0$