"QUIZ" for Lecture 24

NAME: (print!) Fayed Raza **Section:** 24

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.

$x = \cos t$

$y = \sin t$

$(\cos t \sin t + 2\sin t + 3(1 - (\cos t + \sin t))$

$+ (\sin t \cos t + 2\cos t)j + ((\cos t \sin t + 3\cos t + 4\sin t)k$

$$\int_0^{2\pi} (2\sin t \cos t + 5\cos t + 4\sin t)\,dt$$

$$-\frac{\cos(2t)}{2} + 5\sin t - 4\cos t \Big|_0^{2\pi}$$

$-\frac{\cos(4\pi)}{2} + 5\sin(2\pi) - 4\cos(2\pi)$

$+ \frac{\cos(0)}{2} - 5\sin(0) + 4\cos(0)$

$-\frac{1}{2} - 4 + \frac{1}{2} + 4 = 0$