**"QUIZ" for Lecture 25**

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**E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q25FirstLast.pdf) ASAP BUT NO LATER THAN Dec.8,2020, 8:00pm**

Let

$$F(x,y,z) =$$

$$\langle \cos(\sqrt{1+x^7}+zy^9) \quad , \quad \tan(x^7+y^2+1/z) \quad , \quad \tan^{-1}(e^{xyz}+\cos^6(x^8-y+3z)) \rangle \ ,$$

and let <*P,Q,R*> = *curl* **F**. Compute

$$\frac{\partial P}{\partial x}+\frac{\partial Q}{\partial y}+\frac{\partial R}{\partial z} \ .$$

Be sure to explain everything.

If We let <P, Q, R> = curl of F, $\frac{\partial P}{\partial x}+\frac{\partial Q}{\partial y}+\frac{\partial R}{\partial z}$ is taking the divergence of that <P, Q, R> function. However, since <P, Q, R> is curl F, div(curl(F = 0

**2.** Calculate the surface integral

$\mathrm{R}\,\mathrm{R}_S \mathbf{F} \cdot d\mathbf{S}$, where

$$\mathbf{F}(x,y,z) = \langle 2x + y + z \, , \, x + 2y + z \, , \, x + y + 2z \rangle$$

where $S$ is the surface of the box bounded by the planes $x = 0$, $x = 1$, $y = 0$, $y = 4$, $z = 0$, $z = 5$.

F is the curl of some function

$$\iint_D \left(-P\frac{\partial}{\partial x} - Q\frac{\partial}{\partial y} + R\right) dA \rightarrow \iiint_D 0 - 0 + R \, dA$$

$$\iiint_D x + y + 2z \, dx\,dy\,dz \rightarrow \int_0^5 \int_0^4 \frac{4z+2y+1}{2} \, dy\,dz \rightarrow \int_0^5 8z + 10 \, dz = 150$$