"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

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

and let $\langle P, Q, R \rangle = curl \ \mathbf{F}$. Compute

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

Be sure to explain everything.

$$\boxed{div(curl(F)) = 0}$$

Taking the divergence of the curl is always zero.

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2. Calculate the surface integral
$\int \int_S \mathbf{F} \cdot d\mathbf{S}$, 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 $x=0$, $x=1$, $y=0$, $y=4$, $z=0$, $z=5$.

$div(F) = 2 + 2 + 2$

$(Integrand)(Volume) = Integral$

$\int \int_S F \cdot dS = \int \int \int_v div(F) \, dv$

$(6) \, ((1)(4)(5)) = \boxed{120}$

$= \int \int \int_v 6 \, dv$