

**“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

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

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

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

Be sure to explain everything.

Because the curl  $\mathbf{F} = \langle P, Q, R \rangle$   
so the answer will be the 0  
because taking the divergence of curl is always 0

**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  $x = 0, x = 1, y = 0, y = 4, z = 0, z = 5$ .

$$dP/dx=2 \quad dQ/dy=2 \quad dR/dz=2$$

$$\text{div}\mathbf{F}=2+2+2=6$$

$$\int \int \int 6 \, dz \, dy \, dx \quad x=0..1 \quad y=0..4 \quad z=0..5$$

$$=120$$