"QUIZ" for Lecture 20

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q20FirstLast.pdf) ASAP BUT NO LATER THAN Nov. 16, 8:00pm

1. Find an equation for the tangent plane to the parametric surface

$$x = v^2 \quad , \quad y = u + v \quad , \quad z = u^2 \quad ,$$

at the point $(1, 2, 1)$. Simplify as much as you can!

$1 = v^2$ $\quad 2 = u+v \quad 1 = u^2 ; \; u = v = 1$

$r = \langle v^2, u+v, u^2 \rangle \Rightarrow \langle 1, 2, 1 \rangle$

$r_u = \langle 0, 1, 2u \rangle \Rightarrow \langle 0, 1, 2 \rangle$

$r_v = \langle 2v, 1, 0 \rangle \Rightarrow \langle 2, 1, 0 \rangle$

$n = r_u \times r_v = \langle 0, 1, 2 \rangle \times \langle 2, 1, 0 \rangle = \langle -2, 4, -2 \rangle$

$-2(x-1) + 4(y-2) - 2(z-1) = 0$

$(x-1) - 2(y-2) + (z-1) = 0$

$x - 1 - 2y + 4 + z - 1 = 0$

$x - 2y + z = -2$

2. Evaluate the surface integral

$$\int\int_S z \, dS \quad ,$$

where S is the triangular region with vertices $(2, 0, 0), (0, 2, 0), (0, 0, 2)$.

P Q R

$\vec{PQ} = \langle -2, 2, 0 \rangle$

$\vec{PR} = \langle -2, 0, 2 \rangle$

$\vec{n} = \vec{PQ} \times \vec{PR} = \langle 4, 4, 4 \rangle$

Im confused

$d = \langle 2, 0, 0 \rangle \langle 4, 4, 4 \rangle = 8$

$4(x-2) + 4y + 4z = 8$

$x - 2 + y + z = 2$

$z = 4 - x - y$

$\int_0^2 \int_0^2 (4 - x - y)\left(\sqrt{1 + (-1)^2 + (-1)^2}\, dx\, dy\right)$

$8\sqrt{3}$