"QUIZ" for Lecture 20

NAME: (print!) Daniel Gameiro **Section:** 23

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!

$u_0 = 1 \quad v_0 = 1$

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

$r_u = \langle 0, 1, 2u \rangle \quad r_v = \langle 2v, 1, 0 \rangle$

at $(u, v) = (1, 1)$ $r_u = \langle 0, 1, 2 \rangle$ $r_v = \langle 2, 1, 0 \rangle$

$N = r_u \times r_v = \langle -2, 4, -2 \rangle$

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

$-x + 2y - z = 2$

2. Evaluate the surface integral

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

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

$AB = \langle -2, 2, 0 \rangle \quad AC = \langle -2, 0, 2 \rangle$

$N = AB \times AC = \langle 4, 4, 4 \rangle$

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

$$\int_0^2 \int_0^{2-x} (2-x-y)\sqrt{3} \, dy \, dx = \frac{4}{3}\sqrt{3}$$