

11/16/20 Quiz for Lecture 20 (920)

1) $x = v^2, y = u + v, z = v^2$ at $(1, 2, 1)$

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

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

$$r_u = \langle 1, 1, 0 \rangle$$

$$\left. \begin{array}{l} 1 = v^2 \\ 2 = u + v \\ 1 = v^2 \end{array} \right\} \begin{array}{l} v = \pm 1 \\ u = \pm 1 \end{array} \rightarrow u + v = 2, \text{ so } u = 1, v = 1$$

~~$r_v = \langle 0, 1, 2 \rangle$~~

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

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

$$n = \langle 0, 1, 2 \rangle \times \langle 2, 1, 0 \rangle$$

$$\begin{array}{ccc} i & j & k \\ 0 & 1 & 2 \\ 2 & 1 & 0 \end{array}$$

$$= \langle -2, 4, -2 \rangle$$

$$\langle -2, 4, -2 \rangle \cdot \langle x-1, y-2, z-1 \rangle$$

$$-2x + 2, \quad 4y - 8, \quad -2z + 2$$

$$\underline{x - 2y + z = -2}$$

2) $\iint z \, dS \rightarrow (2, 0, 0), (0, 2, 0), (0, 0, 2)$

$$x + y + z = 2$$

$$z = 2 - x - y$$

$$\int_0^2 \int_0^{2-x} \sqrt{3} \, dy \, dx$$

$$\rightarrow \int_0^2 \sqrt{3} (2-x) \sqrt{3} (2x - x^2/4) dx = 2\sqrt{3}$$