

12/8/20. Lecture Quiz 25.

$$1) \quad P(x, y, z) = \left(\cos \sqrt{1+x^2} + zy^9, \right. \\ \left. \tan(x^2 + y^2 + \frac{1}{z}), \right. \\ \left. \tan^{-1}(e^{xyz}) + \cos^6(x^2 - y + 3z) \right)$$

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

This sum is 0, because $\text{div}(\text{curl}) = 0$.

$$2) \quad \iint_S F \cdot dS = \iiint_E \text{div}(FP) dV.$$

$$E = \{ (x, y, z) \mid 0 \leq x \leq 1, 0 \leq y \leq 4, 0 \leq z \leq 5 \}$$

$$P_x = 2$$

$$Q_y = 2$$

$$R_z = 2$$

$$\int_0^5 \int_0^4 \int_0^1 (2+2+2) dx dy dz$$

$$= 12e^2$$