

Math 53 - Multivariable Calculus

Quiz # 11

November 17th, 2011

Exercise 1. Find a parametric representation for the surface given by the plane that passes through the point $(1, 2 - 3)$ and contains the vectors $\hat{i} + \hat{j} - \hat{k}$ and $\hat{i} - \hat{j} + \hat{k}$.

Exercise 2. Evaluate the surface integral $\int \int_S x^2 y z \, dS$, where S is the part of the plane $z = 1 + 2x + 3y$ that lies above the rectangle $[0, 3] \times [0, 2]$.

Exercise 3. Use the divergence theorem to calculate the flux of $\vec{F} = \langle e^x \sin(y), e^x \cos(y), yz^2 \rangle$ across S , where S is the surface of the box bounded by the planes $x = 0$, $x = 1$, $y = 0$, $y = 1$, $z = 0$, and $z = 2$.