

ASSIGNMENT 11, DUE FRIDAY, DECEMBER 1ST

- (1) Suppose that $G = (\sin(z), \sin(x) + \cos(z), \cos(x))$. Find a vector field F such that $\nabla \times F = G$.
- (2) Use the divergence theorem to write the volume of a connected three-dimensional region R as a surface flux integral.
- (3) Use one step of the multivariate Newton's method to approximate a critical point of the function $f(x, y) = x^2(2y^2 + y) - 2x - y^2$, starting with the initial guess $(x_0, y_0) = (1, -1)$.
- (4) Determine the sign of the divergence of the vector field in the figure below at the indicated points P_1 and P_2 .

