CDS 301 Spring 2013
Scientific Information and Data Visualization

Homework #6

Assignment Date: March 26, 2013
Due Date: April 02, 2013

Gradient, Divergence and Vorticity

Given by the following 2-D function

$$z = \sin(x)\cos(y)$$

(1) Derive the gradient functions (GX and GY) of Z. Write the result in functional format
(2) What is the gradient at points (1, 1) and (-1, -1).
(3) Derive the divergence function (DIV) from the gradient vector (GX, GY). Write the result in functional format.
(4) What is the divergence at points (1, 1) and (-1, -1).
(5) Use what you have learned from the class, write a MATLAB program to visualize (a) the scalar function Z, (b) the vector (GX, GY) and (3) the scalar function DIV. You are free to choose the domain size and the data resolution.

Submission: electronic submission only. You need to submit the following two files
(1) A WORD or PDF file (e.g.,"LastName_CDS301_HW6.doc") that contains the answers to questions (1), (2), (3), and (4). The file should also contain the three images generated from question (5). Description is needed for the three images. The description should also discuss the meaning or results of the visualization of these functions.