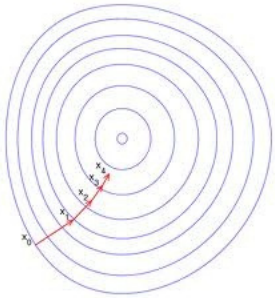
<In the Name of God>

Numerical Analysis Fall 2012, Jan 3rd

Instructor: Dr. Hamed Masnadi-Shirazi



HW #4

Due Date: Final Exam, 2012 (Late HWs will get a zero grade.)

(Note: getting help or helping others on this HW is NOT allowed!)

1) **Gradient Descent and Fixed Point Methods**: (A) Use the gradient descent algorithm to numerically solve the following problem in Matlab. What should you choose for gamma and how many iterations do you need before it converges?

$$5x1 - 2x2 + 3x3 = -1$$
$$-3x1 + 9x2 + x3 = 2$$
$$2x1 - x2 - 7x3 = 3$$

(B) Use the fixed point algorithm to solve the same problem above.

(C) Make a plot of x1 versus iteration number, x2 versus iteration number and x3 versus iteration number for both methods.

(D) Which method is easier to code? Which method converges faster?

(E) Compare your result with Matlabs solutions. By performing x=A\b ;

Submission Guide: submit your Matlab program. Submit the output of your program. Failing to follow the above guidelines will result in a ZERO grade!