1. F(x) = x4 – ½ x2 + 1
2. (10%) Find the stationary points
3. (10%) Test the stationary points to find minimum or maximum points.
4. Suppose we have the following input/target pairs:

(**x1** = [1,1], *d1* = 1), (**x2** = [1,-1], *d2* = -1)

1. (15%) Train an ADALINE network for 2 iterations (with initial weights set to zero and a learning rate equal to 0.5).
2. (10%) Without running a long number of training iterations, suggest a final set of weights solving the problem and draw the decision boundary.
3. (15%) Assume that the patterns occur with equal probability, and they are used in train an ADALINE network with no bias. What does the mean square error performance surface look like?
4. (10%) What is the maximum stable learning rate for the LMS algorithm.
5. For the network shown on slide 7, page 44, assume that y(k) is a stationary process.
6. (10%) Write an expression for the mean square error in terms of Cy(n).
7. (10%) Given a specify expression for the mean square error when

y(k) = sin(k/5)

1. (10%) Find maximum stable learning rate for the LMS algorithm.