King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
Math-321 , Semester (991)
Instructor : Dr. Faisal Fairag
HOMEWORK(3)

Due October 18,1999

PLEASE SUBMIT CLEAR,CLEAN AND NEAT FORM.

(please use A4 size paper for computer output)

Problem 1

(a) Write a Matlab function **function [a]=coef(x,y)**
which computes the coefficients required in the Newton interpolating polynomial.
Input: nodes point in the vectors x,y output: a is the coefficients vector.
(b) Write Matlab function **function [ev]=eval(x,a,t)**
which requires as input the vector x and the vector a which is output from coef.m.
The function then returns the value of the interpolating polynomial at t.
(c) Test your Matlab functions with problem 5 page 136. Draw a graph of the resulting polynomial. [use the Matlab command **plot**]
(d)Test your Matlab functions with problem 20 page 138.

Problem 2

Let $f(x) = \frac{1}{x^2+1}$. [use coef.m and eval.m]
(a) Draw the graph of the polynomial of degree n that interpolates the function f at n+1 equally spaced points in the interval $[-5, 5]$. use n=5,8.[show me all the Matlab commands]
(b) what conclusion can be drawn in part a?
(c) Draw the graph of the polynomial of degree 8 that interpolates the function f at nine chebyshev nodes. [show me all the Matlab commands]

Problem 3

(a) do problem 27 , page 139 [use Matlab commands **ezplot**]
(b) do problem 30 , page 139
(c) do problem 37 , page 140
(d) do problem 43 , page 141

Problem 4

(a) do problem 7 , page 149
(b) do problem 11 , page 150
(c) do problem 13 , page 150