

Math 712 Homework Assignment 1

Due: Monday Sep. 15

- Instructions:** 1. *Everything must be returned in report form and must be type-written.*
2. *You must submit your code.*
3. *Late assignments are NOT accepted.*

Problem 1.

Read the following paper (available on my course website:

<http://web.njit.edu/~jiang/math712.html>):

Bengt Fornberg, “Generation of finite difference formulas on arbitrarily spaced grids”.

- (a) Find the order of accuracy of the finite difference using $n + 1$ points to approximate the m th derivative in general case. Explain.
- (b) Repeat part (a) for the special case of the centered approximation, explain your answer.
- (c) Implement the algorithm in the paper and reproduce all tables in the paper. A symbolic implementation using Maple or Mathematica is preferred to obtain those fraction numbers.