Numerical Analysis MAT 362: Homework 5

Due on Wednesday, March 06 in class

Please read the Instructions

- **Show all the steps that you go between the question and the answer. Show how you derived the answer. For your work to be complete, you need to explain your reasoning and make your computations clear.**
- **You will be graded on the readability of your work.**
- **The correct answer with no or incorrect work will earn you NO marks**
- **Show ALL your work**
- Use only four decimal places for all numbers.
- **If possible, use 8.5" × 11" white paper (not torn from spiral binders) and staple sheets together.**
- Print your name legibly in the upper corner of the page.
- Write your solutions as though you're trying to convince someone that you know what you're talking about.
- **Failure to follow these instructions will result in loss points (up to the full amount of the homework total)**

Problem 1

For $f(x) = x^2 \ln x$, approximate $f'(1)$ using the two-point FDM, BDF, and CDF with h = 0.3.

Problem 2

For $f(x) = x^2 \ln x$, find the maximum error in approximating $f'(1)$ by the two-point FDM, BDF, and CDF with h = 0.3.

Problem 3

From the following table approximate $f'(1)$ by the **three-point** FDF and BDF.

x	0.4	0.7	1.0	1.3	1.6
$f(x)$	−0.1466	−0.1747	0.0000	0.4433	1.2032