**University of Colorado**
**Department of Computer Science**

**Numerical Computation** CSCI 3656

**Spring 2016**

Problem Set 10

Issued: 29 March 2016

Due: 5 April 2016

In problems 1-3, just do the (d) matrix.

1. *[10 pts]* Problem 1 on page 224

2. *[10 pts]* Problem 3 on page 224

3. *[10 pts]* Use the two-point forward difference formula to approximate $f'(1)$, where $f(x) = e^x + 0.5$, for $h = 0.1$, $h = 0.01$, and $h = 0.001$. Compare these estimates to the true value. Was this what one should expect, given the progression of values of $h$? Explain.

4. *[10 pts]* Repeat problem 4 using the three-point centered difference formula. Please also compare the results of the forward and centered difference calculations at each $h$ value—to each other and to the true value. Which one is better, for a given $h$? Will that *always* be true?