

AMSC/CMSC 460 Quiz 9 , Fall 2002

Show all work. You may leave arithmetic expressions in any form that a calculator could evaluate. By putting your name on this paper, you agree to abide by the university's code of academic integrity in completing the quiz. Use no books, calculators, cellphones, communication with others, scratchpaper, etc.

Name _____

Student number _____

1. (10) Suppose we have used a PECE method with predictor of order 4 (i.e., local error is proportional to $O(h^5)$, where h is the stepsize) and corrector of order 5. We want to keep the local error less than τ . Estimate the local error and explain how to alter the stepsize if necessary to achieve our local error criterion.

2. (10) Let

$$\begin{aligned}y' &= y^2 - 5t \\ y(0) &= 1\end{aligned}$$

Apply a PECE scheme to this problem, using Euler and Backward Euler with a stepsize $h = .1$, to obtain an approximation for $y(.1)$.