Math 472: Assignment 3 — due Monday, Oct. 10, 2005

1. Do Exercise 2.1 (for the two three-step methods only) in the textbook.

2. Which of the following multistep methods is convergent?

   (a) $\boldsymbol{y}_{n+2} - \boldsymbol{y}_n = h\left[\boldsymbol{f}(t_{n+2}, \boldsymbol{y}_{n+2}) - 3\boldsymbol{f}(t_{n+1}, \boldsymbol{y}_{n+1}) + 4\boldsymbol{f}(t_n, \boldsymbol{y}_n)\right]$,

   (b) $\boldsymbol{y}_{n+2} - 2\boldsymbol{y}_{n+1} + \boldsymbol{y}_n = h\left[\boldsymbol{f}(t_{n+2}, \boldsymbol{y}_{n+2}) - \boldsymbol{f}(t_{n+1}, \boldsymbol{y}_{n+1})\right]$,

   (c) $\boldsymbol{y}_{n+2} - \boldsymbol{y}_{n+1} - \boldsymbol{y}_n = h\left[\boldsymbol{f}(t_{n+2}, \boldsymbol{y}_{n+2}) - \boldsymbol{f}(t_{n+1}, \boldsymbol{y}_{n+1})\right]$,

   (d) $\boldsymbol{y}_{n+2} - 3\boldsymbol{y}_{n+1} + 2\boldsymbol{y}_n = h\left[\boldsymbol{f}(t_{n+2}, \boldsymbol{y}_{n+2}) + \boldsymbol{f}(t_{n+1}, \boldsymbol{y}_{n+1})\right]$,

   (e) $\boldsymbol{y}_{n+2} - \boldsymbol{y}_n = h\left[\boldsymbol{f}(t_{n+2}, \boldsymbol{y}_{n+2}) - 3\boldsymbol{f}(t_{n+1}, \boldsymbol{y}_{n+1}) + 2\boldsymbol{f}(t_n, \boldsymbol{y}_n)\right]$,

3. Do Exercise 2.4 in the textbook.