

Boundary Value Problems:

Due 10/15

Page 671 #1. Show the details of constructing the 5 by 5 matrix needed to estimate the solution of BVP. Display the 5 by 5 matrix in tridiagonal form. DO NOT solve the system.

Due 10/20

Page 671 #12. Use 5 subintervals. Show the details of constructing the 6 by 6 matrix needed to estimate the solution of BVP. Display the 6 by 6 matrix in tridiagonal form. **Solve** the system using MATLAB routine **tridiag**.

Method of False Position; Section 2.2

Due 10/15

For Page 78 #1a do the computations by hand/calculator showing your steps to 5 decimal places. Record values in a table like the following. The sequence of x-intercepts p_1, p_2, p_3 is what is requested. The initial interval in "technically" not counted as members of the sequence of approximations. So you need to compute 3 xintercepts and the next interval containing the root.

<u>XL</u>	<u>XR</u>	<u>$p_n = Xinter$</u>	<u>$f(Xinter)$</u>
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Due 10/20

For Page 80 #11(a); note you are to find ALL real roots. (Hint: graph things.) Use the Matlab routine **falsepos**. Show the table of values generated.

For Page 81 #13 Use the Matlab routine **falsepos**. Show the table of values generated.

Fixed Point Methods; Section 2.3

Due 10/20 Hand out called Fixed Point Exercise, and Page 93 Exercises for Section 2.3: #1, 6

For #1a, recall that $p_n - p_{n-1} = g(p_{n-1}) - g(p_{n-2})$ and use the Mean Value Theorem.

For part b, recall that for linearly convergent fixed point scheme the asymptotic error constant is $\lambda = g'(p)$, thus $e_n \approx g'(p) e_{n-1}$ and that $e_n = p - p_n$.

In #6(a) you need to find the value of the unique fixed point. (Hint: solve $g(x) = x$ for x .)

For #6(d), you can use software (use **fixedpt** in MATLAB; look at the help file first)

to compute the seven approximations, but then you need to compute the exact error for p_1 through p_7 as well as use formulas in Equations (1) and (2) to estimate the per step error.

Due 10/22 Page 93 Exercises for Section 2.3: # 8, 9, 11

For #8 and #9 the Theorem on Page 91 is useful. (These are theoretical exercises.)

For #11 you will need software; use **fixedpt** in MATLAB. (Look at the help file first.)