

CEE 6510 – Fall 2004 – Assignment No. 3

[1]. Given the system of linear equations:

$$\begin{aligned}2x + 3y - 5z &= 22 \\-x + 2y + z &= 15 \\x + y - 3z &= 24\end{aligned}$$

- Write the system as a matrix equation of the form $\mathbf{A}\cdot\mathbf{x} = \mathbf{b}$. Then, enter matrix \mathbf{A} and vector \mathbf{b} in Matlab.
- Determine the inverse of \mathbf{A} .
- Calculate the determinant of \mathbf{A} .
- Find the solution \mathbf{x} for the matrix equation.
- Determine the characteristic polynomial for \mathbf{A} .
- Calculate the eigenvalues and eigenvector of \mathbf{A} .

[2]. Calculate the integral $I = \int_0^2 \frac{d\xi}{\sqrt{1+\xi^2}}$ by using (a) a symbolic expression with function *int*; (b) a numerical approximation with function *quad*; and (c) a numerical approximation with function *quad8*.

[3]. Use function *solve* to obtain the symbolic solution to the system of equations:

$$\begin{aligned}x^2 + 2xy &= 14 \\x^2 + y^2 &= 29\end{aligned}$$

[4]. Solve exercise [1] in the document *HydraulicsEquationsSolutionsMatlab.pdf* (Manning's equation solution).

[5]. Solve exercise [2] in the document *HydraulicsEquationsSolutionsMatlab.pdf* (entrance from a reservoir into a long open channel).

Submit:

- Word document showing problem statement, functions or scripts used to solve problem, and output showing solution. Include your name in this document.
- M-files with Matlab scripts and functions.
- Input or output text files.

How to submit your assignment:

Place the Word document, *m*-files, and input and output text files in a zip file. E-mail the zip file to: gurro@cc.usu.edu