

Name: _____

Class: MATH2019 Engineering Mathematics 2E Term 1
2019

Class #: _____

Section #: _____

Instructor: William McLean

Assignment: MATH2019 - Writing Assignment Questions -
2019 Term 1 - New

Assignment Instructions:

*Writing Assignment***Question 1: (1 point)**

This is a two-part question.

The symmetric matrix $A = \begin{pmatrix} -97 & 18 & 30 \\ 18 & -166 & -48 \\ 30 & -48 & -80 \end{pmatrix}$ has three distinct eigenvalues.

(a) Two of the three eigenvalues are -98 and -49. Suppose that the third eigenvalue is k .Enter the value of k in the box below.

(b) You are given that the symmetric matrix A has three linearly independent eigenvectors $\begin{pmatrix} 6 \\ 3 \\ -2 \end{pmatrix}$, $\begin{pmatrix} 3 \\ -2 \\ 6 \end{pmatrix}$ and

$$\begin{pmatrix} 2 \\ -6 \\ -3 \end{pmatrix}$$
with corresponding eigenvalues -98, -49 and k .Find an orthogonal matrix Q such that $D = Q^T A Q$ is a diagonal matrix, where

$$D = \begin{pmatrix} -98 & 0 & 0 \\ 0 & -49 & 0 \\ 0 & 0 & k \end{pmatrix}$$

Enter the matrix Q in the box below.

Question 2: (1 point)

Using the Heaviside function $u(t)$ write down a function $y(t)$ that represents the plot below.

You may use the [plot](#) button below to compare how your function (in green) looks compared to the given function (in red).

Note: enter only the right hand side of the equation (i.e. do *not* enter $y(t)=\dots$).

