

Math 33A – Week 10

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March 10, 2020

Name: _____

1. Find the eigenvalues and eigenvectors of the following matrices:

$$(a) A = \begin{pmatrix} 1 & 2 \\ 2 & 4 \end{pmatrix}$$

$$(b) B = \begin{pmatrix} 6 & -2 \\ -2 & 3 \end{pmatrix}$$

$$(c) C = \begin{pmatrix} 2 & -1 & -1 \\ -1 & 2 & -1 \\ -1 & -1 & 2 \end{pmatrix}$$

2. The matrices in the previous example are symmetric. For each of the matrices in the previous example, perform Gram-Schmidt on the eigenvectors to find a set of orthonormal eigenvectors. Then write $A = QDQ^T$ where Q is the matrix of orthonormal eigenvectors, D is the diagonal matrix of eigenvalues.