

4 a.

The resulting tridiagonal matrix T is:

[7. 3.74165739 -0. 0.]

[3.74165739 10.64285714 9.13085149 0.]

[-0. 9.13085149 10.59421525 -4.77158058]

[0. 0. -4.77158058 5.76292761]

4 b.

Eigenvalues:

[20.99929052 8.87583819 5.20425141 -1.07938012]

Eigenvectors:

[0.17920453 -0.68815524 0.65013905 0.26767018]

[0.67048797 -0.34499895 -0.31202383 -0.5779816]

[0.68704896 0.34875836 -0.08056455 0.63232957]

[-0.21516352 -0.53458928 -0.68809135 0.44096401]