**Section 2**

1. Solve

Find the determinant of the matrix 3.

Determine the solutions of the system, write the answers in parametric form.

5. Given that the is a symmetric matrix, fill in the 3missing entries?

6. If the eigenvalues of 4 x 4 matrix are 2, 3, 5 ± 2i, is it possible that the matrix is a symmetric matrix? Explain.

1. If and are eigenvectors for the two different eigenvalues of a symmetric matrix, how are
2. What is the inverse of an orthogonal matrix Q?
3. On the same set of axes, sketch the solutions to the system

along with the solutions to the corresponding homogeneous system. How are the sets of solutions related?

10. determine all solutions of the system and write your answer in parametric form.

11. Determine the parabola y = a + bx+ cx2which best fits the 6 data points

(-2,3.5),(-1,0.5),(0,-1),(1, 1),(2,1.5),and (3,4).Be sure to write out the originalsystem of equations (should be 6 equations and 3 unknowns), write the normal equations(should be 3 equations and 3 unknowns), and then solve to find a, b,and c (you can solveusing any tool you wish).

12. Rewrite the equation of the ellipse x2+4xy+9y2= 1 as A 1 with

A being a symmetric matrix. Use the eigenvalues and eigenvectors of A to determine thedirections and lengths of the major and minor axes (give numbers in decimal form roundedto 2 decimal places). Also based on the information you have, give a rough sketch of theellipse