Problem 1.

1. To prove is an orthogonal matrix, .

Putting and

1. Program which takes as input a matrix and an off-diagonal position and returns the Jacobi matrix is in folder HW6\_Solution/1\_jacobi\_rotation/jacobi\_rotation.m
2. Test program generates random matrices and show that any desired off-diagonal element pair may be zeroed out using matrix is in folder HW6\_Solution/1\_jacobi\_rotation/jacobi\_rotation\_test.m

Problem 2.

Program to this problem is in HW6\_Solution/2\_jacobi\_eigen

Problem 3.

Program for this problem is in HW6\_Solution/3\_pca

1. 3 dimensions of the data hold useful information as given by singular values of the data and 14 dimensions were noise as there were total 17 singular values.
2. The object hidden as a point cloud is a tennis shoe.