1. Develop a MATLAB program to solve this planar 3R robot inverse-pose kinematics problem completely (i.e., to give all multiple solutions). Test your program, using the following input cases:

i) $${}^0_H T = \begin{bmatrix} 1 & 0 & 0 & 9 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}.$$

ii) $${}^0_H T = \begin{bmatrix} 0.5 & -0.866 & 0 & 7.5373 \\ 0.866 & 0.6 & 0 & 3.9266 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}.$$

iii) $${}^0_H T = \begin{bmatrix} 0 & 1 & 0 & -3 \\ -1 & 0 & 0 & 2 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}.$$

iv) $${}^0_H T = \begin{bmatrix} 0.866 & 0.5 & 0 & -3.1245 \\ -0.5 & 0.866 & 0 & 9.1674 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}.$$

2. Write programs that gets the point P, line direction, and angle T from input and perform the following operations on them:

    a) Rotate point P by angle T around the line and print the result.

    b) Mirror point P with respect to the line and print the result.