Survey of Geometry Farris

Practice Problems for Quiz 3

Transformations: Some, but not all of the matrices below represent isometries. For each transformation, draw a "before and after" diagram for the triangle with vertices (0,0), (4,0), and (4,3); then describe the transformation in words. For each example, find the stable set and find all invariant lines (using the inverse matrix and Theorem 4.3.1).

$$A = \begin{pmatrix} -1 & 0 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}, \quad B = \begin{pmatrix} -1 & 0 & 4 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{pmatrix}, \quad C = \begin{pmatrix} 3 & -4 & 4 \\ 4 & 3 & -22 \\ 0 & 0 & 1 \end{pmatrix}, \quad D = \begin{pmatrix} -\frac{7}{25} & \frac{-24}{25} & 8 \\ -\frac{24}{25} & \frac{7}{25} & 6 \\ 0 & 0 & 1 \end{pmatrix}$$