Seatwork (Introduction to Linear Algebra)

1. Draw the following vectors, in the Cartesian plane

$$\vec{p} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}, \vec{q} = \begin{bmatrix} -1 \\ 2 \end{bmatrix}, \vec{r} = \begin{bmatrix} -1 \\ -2 \end{bmatrix}, \vec{s} = \begin{bmatrix} 3 \\ -1 \end{bmatrix}, \vec{t} = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$$

2. After applying a horizontal shear and vertical flip, draw the new location of the vectors. Calculate the determinant of the transformation.

3. Apply the following transformation to the vectors above. Draw the result of the transformations. Calculate the determinant.

$$\begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$$

4. Calculate the determinants of these transformations:

$$A = \begin{bmatrix} 1 & -1 & -2 \\ 2 & 3 & -4 \\ -2 & 1 & 4 \end{bmatrix}, B = \begin{bmatrix} 2 & -4 & 2 \\ 0 & 8 & 1 \\ -3 & 2 & 5 \end{bmatrix}$$

5. Find the inverses of the transformation matrices

$$A = \begin{bmatrix} 1 & -1 & -2 \\ 2 & 3 & -1 \\ -2 & 1 & 2 \end{bmatrix}, C = \begin{bmatrix} 3 & 2 \\ -1 & 2 \end{bmatrix},$$

$$D = \begin{bmatrix} 4 & 0.5 \\ -2 & -1 \end{bmatrix}, E = \begin{bmatrix} -1.5 & 1 & -0.5 \\ 4 & -2 & 1 \\ -0.5 & 0 & -0.5 \end{bmatrix},$$