Math 002B Assignment 1.9 Last Name_____________________ 1st_________

1. Assume that T is a linear transformation. Find the standard matrix of T.

$T:\Re^2 \to \Re^3$

$T(e_1) = (2,3,1),\ T(e_1) = (-1,2,3).$

2. Assume that T is a linear transformation. Find the standard matrix of T, Where $T:\Re^2 \to \Re^2$ rotates points (about the origin) through 5π/6 radians.

3. Assume that T is a linear transformation. Find the standard matrix of T. That transform the parallelogram with vertices (0,0), (2,0), (1,2) and (3,2), to a square with edges (0,0), (1,0), (0,1) and (1,1) Verify your answer by mapping the four vertices of the rectangle to the vertices of the square.

4. Assume that T is a linear transformation. Find the standard matrix of T.
$T:\Re^2 \rightarrow \Re^3$ is a vertical shear transformation that maps $\mathbf{e}_1$ into $\mathbf{e}_1 - 18\mathbf{e}_2$ but leaves the vector $\mathbf{e}_2$ unchanged.

5. Assume that T is a linear transformation. Find the standard matrix of T.
$T:\Re^2 \rightarrow \Re^3$ first reflects points through the horizontal x_1–axis and then reflects points through the origin.

6. Assume that T is a linear transformation. Find the standard matrix of T.
$T: R^3 \rightarrow R^3$,rotates the vectors in R^3 about the x axis by an angle θ. Verify your answer by rotating (1,0,0), (1,1,1), (1,1,–1) by an angle π/2.