Math 2550 Intro to Linear Algebra Test 1 Name:_____
Must show your work for credit.

1. Find the angle between the vectors $[2 \quad -3 \quad 1 \quad 5]^T$ and $[-3 \quad 4 \quad 6 \quad -1]^T$.

2. Find the system $\begin{bmatrix} 1 & 2 & -3 \\ 3 & -1 & -2 \\ 2 & 3 & -5 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -2 \\ 1 \\ 3 \end{bmatrix}$ by any method.

3. Find the system $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 1 \\ 2 & 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ -3 \\ 1 \end{bmatrix}$ by finding A^{-1}.

4. Find the LU factorization of A=$\begin{bmatrix} 1 & 3 & 5 \\ -2 & 2 & 4 \\ 5 & 1 & 3 \end{bmatrix}$

   What is L^{-1} and U^{-1}.

5. Find the complete solution to Ax=b.
   Find the Column Space of A and the Null Space of A, state that rank + nullity = n.

$$x + 2y - 3z + w = -2$$
$$3x - y - 2z - 4w = 1$$
$$2x + 3y - 5z + w = -3$$