1. Let $u$ and $v$ be $n$ by 1 matrices.
   What are the sizes of $u^Tv$, $v^Tu$, $uv^T$, and $vu^T$?
   Are any of these matrices equal? If so, which ones?

2. Find all values of $b_1$, $b_2$, and $b_3$ for which the following system has a solution.

$$
\begin{bmatrix}
1 & 0 & 1 \\
0 & 1 & 1 \\
0 & 0 & 0
\end{bmatrix}
\begin{bmatrix}
x \\
y \\
z
\end{bmatrix}
=
\begin{bmatrix}
b_1 \\
b_2 \\
b_3
\end{bmatrix}
$$

3. page 47, #1(b), #1(c)

4. page 48, #14.

5. Find the inverse to the matrix $A$ below by reducing to rref the matrix $(A | I_3)$

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