1. For what values of $b$ does the equation $Ax = b$ have a solution, given that
\[
A = \begin{pmatrix} 3 & -1 \\ 1 & 1 \\ -1 & 3 \end{pmatrix}
\]

2. Find the pseudoinverse of
\[
M = \begin{pmatrix} i & 1 \\ -1 & i \end{pmatrix}
\]

3. Consider the matrix
\[
C = \begin{pmatrix} 3 & a & 2 \\ 1 & 4 & -2 \end{pmatrix}
\]

   For what values of $a$ does the Moore-Penrose pseudoinverse of $C$ exist?

4. (a) Find the pseudoinverse $A'$ of the matrix
\[
A = \begin{pmatrix} 4 & 8 \\ 1 & 2 \end{pmatrix}
\]

   (b) Judge how close $A'$ is to being an inverse by evaluating $A'A$. If $A'$ were actually the inverse $A^{-1}$, what would $A'A$ be? Why isn’t $A'$ the same as $A^{-1}$ in this case?

5. Keener 1.5.1 - a,b (p.54)

6. Keener 2.1.1 (p.93)