The tests are cumulative. This guide gives some sample questions for Sections 2.7, 3.1–3.5, 5.1 and 5.2. Doing these problems does not replace doing homework problems.

1. Define inverse. Define minor. Define cofactor. [might be in True/False format]
2. State the relationship between the order (size) of $\mathbf{A}$, rank($\mathbf{A}$), rank($\mathbf{A^b}$), the consistency of the system $\mathbf{Ax} = \mathbf{b}$, and the number of arbitrary unknowns in the solution of $\mathbf{Ax} = \mathbf{b}$.
3. Prove that $\mathbf{A}^{-1}\mathbf{B}^{-1} = (\mathbf{BA})^{-1}$. [Theorems and properties from section 3.4. Some to prove, some as True/False.]
4. Given $\mathbf{A}$ and $\mathbf{b}$, one method to solve $\mathbf{Ax} = \mathbf{b}$ starts by forming the augmented matrix $\mathbf{A^b}$ and then using elementary row operations to transform it to row-reduced form. In each part below, the row-reduced form of $\mathbf{A^b}$ is given. Determine whether or not the system is consistent and find all solutions.
   (a) $\left[\begin{array}{ccc|c} 1 & 2 & 3 & 4 \\ 0 & 1 & 5 & 6 \\ 0 & 0 & 0 & 1 \end{array}\right]$
   (b) [several parts, mixed up: inconsistent, unique, 1 parameter, 2 parameter...]
5. Let $\mathbf{A}$ = [3x3 with very easy numbers].
   (a) Compute $\mathbf{A}^{-1}$.
   (b) Multiply $\mathbf{AA}^{-1}$ to check that it equals $\mathbf{I}$. (Show your work.)
   (c) Use $\mathbf{A}^{-1}$ to solve $\mathbf{Ax}$ = [3x1]
6. Let $\mathbf{A}$ = [3x3 with easy numbers].
   (a) Compute the **LU** decomposition of $\mathbf{A}$.
   (b) Multiply **LU** to check that it equals $\mathbf{A}$. (Show your work.)
   (c) Use the **LU** decomposition to solve $\mathbf{Ax}$ = [3x1].
7. Compute the following determinants.
   (a) |2x2 with variables| =
   (b) |4x4 with some zeros| =