

- The test is in class on Friday 16 April and covers Chapters 1 and 2. You must notify me in advance if you have to miss the test.
- Only Math 510 students are responsible for the material in Section 2.8. They will have an extra question to prove a lemma or theorem in that section or a theorem from an earlier section.

Here are some sample test questions/topics. Things written in [brackets] are comments.

- [Probably a 2×2 with some of these questions and a 3×3 with others of these questions.] Let $\mathbf{A} = \begin{bmatrix} 1 & 2 \\ -4 & 3 \end{bmatrix}$, $\mathbf{C} = \begin{bmatrix} 1 & -2 \\ 5 & 3 \end{bmatrix}$ and $\mathbf{b} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$.
 - Compute \mathbf{AC} . Compute $\mathbf{A} - 2\mathbf{I}$. Compute \mathbf{Ab} . Compute $\mathbf{A}^T\mathbf{C}$.
 - Compute the length of \mathbf{b} .
 - Compute the rank of \mathbf{A} .
 - Compute the rank of the augmented matrix \mathbf{A}^b . How many solutions will $\mathbf{Ax} = \mathbf{b}$ have?
 - Solve $\mathbf{Ax} = \mathbf{b}$. [May have one, zero, or many solutions.]
 - Solve $\mathbf{Ax} = \mathbf{b}$ using Gaussian Elimination with partial [could be scaled or complete] pivoting.
- [Some word problem or other way to connect linear systems to reality.] Consider (but do not solve) the system of equations

$$\begin{cases} x + 2y = 3 \\ 4x + 5y = 6 \end{cases} .$$

Create a word problem that would result in this system of equations. Describe the meaning of x and y in your problem, and what each equation represents.

- Define what it means for a set of vectors to be linearly independent.
 - Determine if the set of vectors

$$\left\{ \begin{bmatrix} 1 \\ 3 \\ 4 \end{bmatrix}, \begin{bmatrix} 1 \\ 3 \\ 5 \end{bmatrix}, \begin{bmatrix} 1 \\ 3 \\ 6 \end{bmatrix} \right\}$$

is linearly independent.