Midterm 1 Concept Checklist

Chapter 1

- I understand what is meant by a linear system of equations and I understand the difference between a general system, a triangular system, and an echelon system.
- I understand how to use an augmented matrix to solve a system of equations. I understand Gaussian elimination and Gauss-Jordan Elimination, and I understand the difference between the two methods.
- I understand the terms consistent and inconsistent.
- I know what a homogeneous system of equations is, and I know that such a system always has at least one solution.
- I have a geometric understanding of what is meant by "solution set" of a general linear system of equations.
- I can identify pivot positions, pivots, and pivot columns.
- I know what a free variable is, and how to identify them in the algorithmic manner taught in class.

Chapter 2

- I understand addition and scalar multiplication of vectors algebraically and geometrically. I know the algebraic properties that vector addition and scalar multiplication satisfy. I know how to multiply an $n \times m$ matrix A by a vector $\vec{x}$ in $\mathbb{R}^m$.
- I can state the definition of the span of a set of vectors. I can determine if a vector in $\mathbb{R}^n$ is in the span of a set of vectors. I can determine if a set of vectors spans $\mathbb{R}^n$.
- I can state the definition of linear dependence and linear independence.
- I can determine whether a set of vectors is linearly independent or linearly dependent.
- I understand the connection between solving a linear system and determining if a vector is in the span of other vectors.
- I have a conceptual understanding of linear dependence and linear independence. I can rephrase the definition of linear independence or dependence in terms of span and in terms of solutions to linear equations.
- I understand this statement: The following are equivalent.

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- Given two vectors in a plane and a point, I know how to write the scalar equation of that plane.
- I know that the cross product gives me a way to find a vector normal to two given vectors. I know that I can use the cross product to find the area of a parallelogram.