REVIEW FOR FIRST MIDTERM
MATH H54

You are expected to be able to...

- Use row reductions to solve systems of linear equations.
- Determine whether a set of vectors $\{\vec{v_1}, \ldots, \vec{v_n}\}$ are linearly independent. Determine whether a vector $\vec{w}$ is in the span $\text{Span}\{\vec{v_1}, \ldots, \vec{v_n}\}$.
- Compute product of matrices, transpose of a matrix, inverse of an invertible matrix, determinant of a matrix.
- Understand how matrices and linear transformations are related.
- Understand all the statements that are equivalent to a matrix has a pivot in each row. Understand all the statements that are equivalent to a matrix has a pivot in each column. Understand all the statements that are equivalent to a matrix is invertible.
- Determine whether a set (with 'addition' and 'scalar multiplication') is a vector space.
- Compute the coordinates of $\vec{x} \in V$ relative to a basis of V.
- Find a basis of $\text{Nul}(A)$ and $\text{Col}(A)$ of a matrix.
- Understand the rank theorem: $\text{rank}(A) + \dim \text{Nul}(A) = n$ for an $m \times n$ matrix A.
- Compute the change-of-coordinates matrix between two bases.
- $\cdots$