MA2.101 Linear Algebra
Spring'24

Assignment 5

Deadline: 8^{th} February, 11:59pm

Instructions:

1) This assignment consists of 3 problems. All problems are compulsory.
2) Mention all assumptions while answering the questions.
3) Be clear in your arguments. Vague arguments shall not be given full credit.
4) Only Handwritten Submissions are allowed. Scan and upload it on moodle.

Problems:

1. Prove that the subspace spanned by a non-empty subset S of a vectorspace V is the set of all linear combinations of vectors in S.

2. If W_1 and W_2 are finite dimensional subspaces of vector space V then prove the following:

   (a) $W_1 + W_2$ is finite dimensional

   (b) $dim W_1 + dim W_2 = dim(W_1 \cap W_2) + dim(W_1 + W_2)$

3. Let R be a non-zero row-reduced echelon matrix, then prove that the non-zero row vectors of R form a basis for the row space of R.