Name:

1. [2pts] Let . Show that each of the following vectors belong to by writing it as a linear combination of the generators of .
2. [2pts] Let where the vectors are over . Show that each of the following vectors over belong to by writing it as a linear combination of the generators of .
3. [2pts] For each of the parts below, show the given vectors over are linearly dependent by writing the zero vector as a nontrivial linear combination of the vectors
4. [2pts] For each of the following matrices (i) give a basis for the row space (ii) give a basis for the column space (iii) verify that the row rank equals the column rank:
5. [2pts] Prove that the direct sum of is a vector space using the properties that define vector spaces.