Last name _____

First name _____

LARSON—MATH 310–HOMEWORK WORKSHEET 11
Bases.

General Instructions

1. Write up a **neat** assignment on a **new sheet** of paper. (Do not cram your answers between the lines).
2. **Number** your problems so that it is easy to see what work matches the assigned problems.
3. Remember to **give examples** (you do not understand a concept unless you can provide an example of it).

Problems

1. Define what it means for a collection of vectors to be **basis**, and give an example. Explain.
2. For each of the following two matrices,
   (a) list the **columns**,
   (b) use our algorithm to find a basis for the column space of the matrix,
   (c) find the rank of the column space, and
   (d) if there are any columns not in the basis, write them as a linear combination of the basis columns.

3. $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 0 \\ 2 & 1 \\ 3 & 4 \end{bmatrix}$

3. For each of the following two matrices,
   (a) list the **rows**,
   (b) use our algorithm to find a basis for the row space of the matrix,
   (c) find the rank of the row space, and
   (d) if there are any rows not in the basis, write them as a linear combination of the basis rows.

3. $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 0 \\ 2 & 1 \\ 3 & 4 \end{bmatrix}$