

LARSON—MATH 310—HOMEWORK WORKSHEET 04

1. Write up a **neat** assignment on a **new sheet** of paper. (Do not cram your answers between the lines). Typed using \LaTeX would be even better.
2. **Number** your problems so that it is easy to see what work matches the assigned problems.
3. Be verbose. Remember that you do not understand a concept if you do not know an **examples**.

Problems

1. (**Notation**). Let A be a list of vectors from a linear space V . What is $\langle A \rangle$? Give an example.
2. What is a *finite-dimensional vector space*? Give an example. Explain.
3. What is a *linearly independent* set of vectors? Give an example. Explain.
4. What is a *linearly dependent* set of vectors?
5. What is a *basis* of linear space? Give an example. Explain.
6. What is the *standard basis* of \mathbb{R}^4 ?
7. Test if the vectors $\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 1 \\ 2 \\ 0 \end{bmatrix}$ are linearly independent or linearly dependent.
8. Test if the vectors $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$, $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ are linearly independent or linearly dependent.
9. Why is every list of vectors containing $\vec{0}$ linearly dependent?