6.1 Handwrite

Welcoming Environment: Actively listen to others and encourage everyone to participate! Keep an open mind as you engage in our class activities, explore consensus and employ collective thinking across barriers. Maintain a professional tone, show respect and courtesy, and make your contributions matter.

Discuss and keep track of any questions your group has. Ask me questions during group work time as well as when I bring us back together. Try to help each other solidify and review the language of linear algebra, algebra, visualizations and intuition from this section, including those related to:

- inner product of $\vec{u}$ and $\vec{v}$ and connection to the dot product
- length or norm of a vector
- orthogonal vectors

Take out your notes from the activities due today as well as both fill-in guides. Use them and each other to respond to the following by handwriting in the language of our class. Use only what we have covered so far in our readings, videos and quizzes.

1. **Building Community**: What are the preferred first names of those sitting near you? If you weren't able to be there, give reference to anyone you had help from or write N/A otherwise.

2. Determine if the following vectors are orthogonal $\vec{u} = \begin{bmatrix} 5 \\ 1 \\ -2 \end{bmatrix}$ and $\vec{v} = \begin{bmatrix} 1 \\ -3 \\ 1 \end{bmatrix}$ and show work/reasoning.

3. a) Find a unit vector in the direction of the vector $\vec{u} = \begin{bmatrix} 10 \\ 3 \\ -1 \end{bmatrix}$ and show work/reasoning.

   b) Roughly sketch $\vec{u}$ and the unit vector using standard mathematical 3D coordinate axes and label the axes as well as both vectors.

   c) The transformation that inputs $\vec{u}$ and outputs the unit vector in part a) is a linear transformation. Which transformation is it? (dilation, projection, reflection, rotation, shear, other)?

   d) What is the matrix representation of this linear transformation A so that $A\vec{u}$ is the unit vector?

Next, as time allows before I bring us back together, work on the additional activities including any pollev activities and respond in your notes rather than here.

Help each other and PDF responses to ASULearn: If you are finished with the handwrite and additional activities before I bring us back together, first ensure that your entire group is finished too, and if not, help each other. Then submit your handwrite, continue reviewing and solidifying or discuss upcoming class work.

Collate your handwritten responses, preferably on this handout, into one full size multipage PDF for submission in the ASULearn assignment. I recommend you turn it in sometime today, but you have until the morning before the next class.