6.1 Handwrite Practice

Handwrite your responses to 1. and 2. below and collate them into a PDF for submission into ASULearn.

1. Determine if the following vectors are orthogonal $\vec{u} = \begin{bmatrix} 10 \\ 3 \\ -1 \end{bmatrix}$ and $\vec{v} = \begin{bmatrix} 1 \\ -3 \\ 1 \end{bmatrix}$ and show work/reasoning.

2. 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 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)?