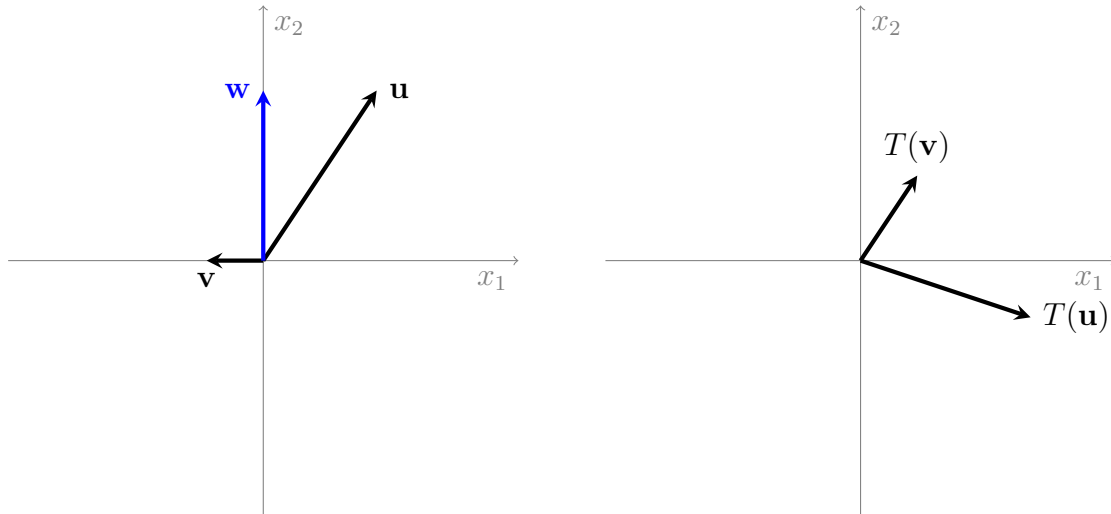


This is a two-stage quiz. You will receive this back with each question graded pass/fail in our next class meeting. You have until the date specified above to submit corrections for partial credit.

1. (3 points) The figure below shows vectors \mathbf{u} , \mathbf{v} , and \mathbf{w} along with the images $T(\mathbf{u})$ and $T(\mathbf{v})$ under the linear transformation $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$. Carefully sketch and label the image $T(\mathbf{w})$ of \mathbf{w} under T .



2. (3 points) Consider a linear transformation $T : \mathbb{R}^4 \rightarrow \mathbb{R}^2$ such that

$$T \left(\begin{bmatrix} 1 \\ -2 \\ -3 \\ 4 \end{bmatrix} \right) = \begin{bmatrix} 1 \\ 2 \end{bmatrix} \text{ and } T \left(\begin{bmatrix} -2 \\ 2 \\ 3 \\ -5 \end{bmatrix} \right) = \begin{bmatrix} -1 \\ 5 \end{bmatrix}.$$

Compute $T \left(\begin{bmatrix} -1 \\ 0 \\ 0 \\ -1 \end{bmatrix} \right)$.

3. (4 points) Let $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ be the transformation which reflects a vector across the x_2 axis before rotating it counterclockwise by $\pi/2$ radians. Find the standard matrix of T .