Homework 1
Introduction to Linear Algebra

Material from Lecture 1

Due Thursday, January 12, 2023

1.3 (✠1.01, 1.02) Let $\mathbf{v} \in \mathbf{R}^3$ be non-trivial, and let $\mathbf{w}, \mathbf{z} \in \mathbf{R}^3$ be non-trivial vectors both perpendicular to $\mathbf{v}$. Show that the halfway point between $\mathbf{w}$ and $\mathbf{z}$ is also perpendicular to $\mathbf{v}$.

1.9 (✠1.01) Use the triangle inequality to show that vector $\mathbf{v}$ is shorter than the sum of the lengths of the vectors $\mathbf{u}, \mathbf{w}, \mathbf{x}$. That is, show with the triangle inequality that $\|\mathbf{v}\| \leqslant \|\mathbf{u}\| + \|\mathbf{w}\| + \|\mathbf{x}\|$.