Math 8
Fall 2019

Written Homework
Assigned Friday, October 11

Note: Standard (not preliminary) written homework is graded on your work and your explanations, not just on your answer.

Explanations are important for many reasons. Being able to communicate what you know shows a depth of understanding beyond that of being able to get the right answer to a problem. Doing the mental work of putting explanations into words helps create that depth of understanding. On exams, we will grade your work and not just your answers, so this is good practice for taking exams.

For all these reasons, be sure to: show all your work; explain your reasoning; use clear English; write neatly so all this effort does not go to waste.

Written homework is always due at 10:00 AM on the following Monday.

Assignment:

1. Express the vector $\langle 1, 2, 3\rangle$ as a sum

$$\langle 1, 2, 3\rangle = \vec{v} + \vec{w}$$

   where $\vec{v}$ is parallel to the vector $\langle 1, 0, -1\rangle$ and vector $\vec{w}$ is perpendicular to the vector $\langle 1, 0, -1\rangle$.

   Hint: Use an appropriate projection to find $\vec{v}$, set $\vec{w} = \langle 1, 2, 3\rangle - \vec{v}$.

2. Use the dot product $\langle 1, 2, 3\rangle \cdot \vec{v}$ to show that $\langle 1, 2, 3\rangle$ and $\vec{v}$ are parallel.

3. Use the dot product $\langle 1, 2, 3\rangle \cdot \vec{w}$ to show that $\langle 1, 2, 3\rangle$ and $\vec{w}$ are orthogonal.