Name _____

Homework 7
Section 13.3

1. (6) Consider the vector $\vec{w} = 5\vec{i} + 4\vec{j} + 2\vec{k}$, and the vector $\vec{v}$ which has the following properties:

   - $\|\vec{v}\| = \sqrt{29}$
   - $\vec{v} \cdot \vec{w} = 6$
   - $\vec{v} - 2\vec{j}$ is orthogonal to $\vec{w} + \vec{i}$
   - All components of $\vec{v}$ are integers

   Determine the component form of the vector $\vec{v}$ which satisfies these properties.

2. (2ea) Consider the plane $z = 6x + 2y - 5$.

   (a) Find a nonzero vector perpendicular to the plane.

   (b) Find a nonzero vector parallel to the plane.

3. (6) Write the vector $\vec{q} = 4\vec{i} - \vec{j} - 5\vec{k}$ as the sum of two vectors, one parallel, and one perpendicular, to $\vec{m} = 3\vec{i} + 2\vec{j} + \vec{k}$.

4. (4) Compute the angle between the vectors $\vec{v} = 2\vec{i} + 5\vec{j} + 7\vec{k}$ and $\vec{w} = -\vec{i} - 3\vec{j} + 4\vec{k}$.