Linear Algebra - MTH215 - Spring 2002

QUIZ 1, on sections 1.1, 1.2 - Name:

For problems 1-3 below, let

\[ u = [1, 2, -3] \quad v = [1, 2, -1] \quad w = [-3, 0, 1] \]

1. Find

\[ z = u - 2v + 3w. \]

**Sol:**

\[ z = [1, 2, -3] + [-2, -4, 2] + [-9, 0, 3] = [-10, -2, 2] \]

2. Find \( ||z|| \).

**Sol:**

\[ ||z|| = \sqrt{100 + 4 + 4} = \sqrt{108} \]

3. Find \((u + v) \cdot w\).

**Sol:**

\[ [2, 4, -4] \cdot [-3, 0, 1] = -6 + 0 - 4 = -10 \]

4. Given the vectors \( u, v, \) and \( w \) drawn below, express \( w \) as a linear combination of \( u \) and \( v \).

**Sol:** Approximately

\[ -2v + 1.5u = w \]

5. Name a vector in the span of \( w = [1, 1, 0] \) and \( x = [2, 0, 1] \).

**Sol:** For instance: \( w + x = [3, 1, 1] \).