

Name \_\_\_\_\_

Homework 5  
Sections 13.1 & 13.2

1. (1ea) Use the vectors

$$\vec{v} = 3\vec{i} - 2\vec{j} + 5\vec{k}, \quad \vec{w} = 3\vec{j} - 8\vec{k}, \quad \vec{q} = \sqrt{10}\vec{i} + 7\vec{j} + 6\vec{k}$$

to compute the following:

(a)  $-2\vec{v}$

(b)  $\vec{v} - \vec{w} + \vec{q}$

(c)  $\|\vec{q}\|$

(d)  $\|\vec{v} + \vec{w}\|$

(e)  $\|\vec{v}\| + \|\vec{w}\|$

2. (3) Find a unit vector that points from  $(1, 2, 5)$  toward  $(8, -3, 6)$ .

3. (3) Find a vector of length 3 that points in the opposite direction of  $6\vec{i} - 8\vec{k}$ .

4. (4) Find all vectors in 2 dimensions having magnitude 13 and  $\vec{j}$ -component equal to  $12\vec{j}$ .

5. (5) A lion, a tiger, and a bear are all pulling on a certain object. The lion is pulling on the object with a force of 30 newtons in a direction  $50^\circ$  north of due east, while the tiger is pulling on the object with a force of 40 newtons in a direction  $75^\circ$  south of east. If the object is remaining stationary, determine the force and the direction that the bear is pulling on the object. [Round answers to the nearest 0.01]