Math 1151, Lecture 010, Evaluative Exercise 6
April 22, 2010

Name: _____

Discussion Section: _____

Discussion TA: _____

Seating Section: Left Front Right Front
Left Back Right Back

You have twenty-five minutes to complete the following seven problems, without using your notes or your book. You may use a scientific a calculator.

1. For the vector $v = -3\hat{i} + 4\hat{j}$, find its magnitude $|v|$ and its unit vector $\hat{v}$.

2. For the vectors $v = 2\hat{i} - 3\hat{j}$, and $w = 3\hat{i} + \hat{j}$,

   (a) Find $v + w$. Graph v, w, and $v + w$ on the same set of axes.

   (b) Write v as the sum of two vectors v_1 and v_2, where v_1 is in the direction of w and v_2 is orthogonal to w. Graph v, v_1, v_2, and w on the same set of axes.

3. Write the first five elements of the following sequences:

   (a) $\{a_n\} = \left\{ \frac{(-1)^{n+1}}{n} \right\}$

   (b) $a_1 = 5$, $a_n = 2\,a_{n-1}$, for $n > 1$

4. Find a general formula for the n^{th} element of the sequence:

   (a) 1, 3, 5, 7, 9, ...

   (b) -3, 9, -27, 81, ...

5. Find the value of the sum

$$\sum_{k=1}^{8} 3k + 1$$

6. Find the first element and the common difference for the arithmetic sequence $\{4 - 3n\}$.

7. **Challenge:** Find the value of the sum $7 + 11 + 15 + 19 + \cdots + 403$.