**MATH 396** **Mathematics for 3D Graphics** **Fall 2008**

## Homework # 2

**Due: Tue. Sep. 23, 2008**

**Directions:** solve the following problems. You can work with others and discuss the problems, but each student must write his/her own, independent solution. If you are unsure about what i mean by this, please ask!

**What to turn in?** Sort the solutions of the assigned problems –by chapter and problem number, staple the pages together, and write your name, student ID, MATH396 and HW # 2 in the front page.

**Chapter 2,** pg. 68: 2, 3, 4, and 5.

**Chapter 3,** pg. 98: 1 - 4.

**Additional Problems:**

**Problem 1.** Let $V = \{(a_1, a_2) : a_1, a_2 \in \mathbb{R}\}$. Define addition of elements of $V$ coordinatewise (*i.e.*, $(a_1, a_2) + (b_1, b_2) = (a_1 + b_1, a_2 + b_2)$), and for $c \in \mathbb{R}$, define $c \cdot (a_1, a_2) = (a_1, 0)$. Is $V$ a vector space under this operations? Justify your answer.

**Problem 2.** Let $V = \{(a_1, a_2) : a_1, a_2 \in \mathbb{R}\}$. For $(a_1, a_2)$ and $(b_1, b_2) \in V$ and $c \in \mathbb{R}$, define

$$(a_1, a_2) + (b_1, b_2) = (a_1 + 2b_1, a_2 + 3b_2) \quad \text{and} \quad c \cdot (a_1, a_2) = (ca_1, ca_2).$$

Is $V$ a vector space under this operations? Justify your answer.

**Reading assignment:** chapter 4.