HW QUIZ #1 **score____/35** **Name______________________________**

Math 238: 2.1, 2.2 ***JUSTIFY EVERYTHING!!!!!!***

12 pts 1. a) Determine whether the *Commutative Property of Addition* for a vector space hold for the addition and scalar multiplication on ordered pairs of real numbers defined by

$$(x_1, y_1) \oplus (x_2, y_2) = (x_1, y_2)$$
$$c \odot (x, y) = (cx, cy)$$

b) Determine whether each of the two *Distributive Law Properties* for a vector space hold under the above definitions.

8 pts 2. Determine the *zero vector and additive inverse vector* for the following vector space: The set of ordered pairs of positive real numbers under the addition and scalar multiplication defined by the following:

$$(x_1, y_1) \oplus (x_2, y_2) = (x_1 x_2, y_1 y_2)$$
$$c \odot (x, y) = (x^c, y^c)$$

Zero vector:

Additive Inverse vector:

5 pts 3. Is the set of all vectors of the form $(x, y, x^2 + y^2)$, where $x, y \in \mathbb{R}$, a subspace of $\mathbb{R}^3$?

10 pts 4. Is the set $I \equiv \{ f \in C[a,b] \text{ for which } \int_a^b f(x)dx = 0\}$ a subspace of $F[a,b]$?