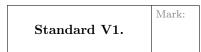
Name:	
J#:	Dr. Clontz
Date:	

MASTERY QUIZ DAY 12

Math 237 – Linear Algebra Fall 2017

Version 6

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let V be the set of all pairs of real numbers with the operations, for any $(x_1, y_1), (x_2, y_2) \in V, c \in \mathbb{R}$,

$$(x_1, y_1) \oplus (x_2, y_2) = (x_1 + x_2, y_1 + y_2)$$

 $c \odot (x_1, y_1) = (c^2 x_1, c^3 y_1)$

- (a) Show that scalar multiplication **distributes scalars** over vector addition: $c \odot ((x_1, y_1) \oplus (x_2, y_2)) = c \odot (x_1, y_1) \oplus c \odot (x_2, y_2).$
- (b) Determine if V is a vector space or not. Justify your answer.

Standard V3.
$$\begin{bmatrix} 1\\1\\2\\1\end{bmatrix}, \begin{bmatrix} 3\\3\\6\\3\end{bmatrix}, \begin{bmatrix} 3\\-1\\3\\-2\end{bmatrix}, \text{ and } \begin{bmatrix} 7\\-1\\8\\-3\end{bmatrix} \text{ span } \mathbb{R}^4.$$

Mark: Standard V4.

Let W be the set of all \mathbb{R}^3 vectors $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$ satisfying x+y+z=0 (this forms a plane). Determine if W is a subspace of \mathbb{R}^3 .

 ${\bf Additional\ Notes/Marks}$