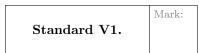
Name:	
J#:	Dr. Clontz
Date:	

MASTERY QUIZ DAY 14

Math 237 – Linear Algebra Fall 2017

Version 5

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.

Mark:

$$\begin{bmatrix}
8 \\
21 \\
-7
\end{bmatrix}, \begin{bmatrix}
-3 \\
-8 \\
3
\end{bmatrix}, \begin{bmatrix}
-1 \\
-3 \\
2
\end{bmatrix}, and \begin{bmatrix}
4 \\
11 \\
-5
\end{bmatrix} span \mathbb{R}^3 .$$

Standard V4.	Mark:
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Determine if the set of all lattice points, i.e. $\{(x,y) \mid x \text{ and } y \text{ are integers}\}$ is a subspace of \mathbb{R}^2 .

Standard S2.

Mark:

Determine if the set $\{x^3 - x, x^2 + x + 1, x^3 - x^2 + 2, 2x^2 - 1\}$ is a basis of \mathcal{P}_3

Additional Notes/Marks