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| Name: |
| J#: |
| Date: |

Dr. Clontz

MASTERY QUIZ DAY 12

Math 237 – Linear Algebra

Version 4

Fall 2017

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.

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| Standard V1. | Mark: |
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Let V be the set of all pairs of real numbers with the operations, for any $(x_1, y_1), (x_2, y_2) \in V$, $c \in \mathbb{R}$,

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

$$c \odot (x_1, y_1) = (0, cy_1)$$

- Show that this scalar multiplication \odot distributes over scalar addition.
- Determine if V is a vector space or not. Justify your answer.

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| Standard V3. | Mark: |
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Does $\text{span} \left\{ \begin{bmatrix} 2 \\ -1 \\ 4 \end{bmatrix}, \begin{bmatrix} 3 \\ 12 \\ -9 \end{bmatrix}, \begin{bmatrix} 1 \\ 4 \\ -3 \end{bmatrix}, \begin{bmatrix} -4 \\ 2 \\ -8 \end{bmatrix} \right\} = \mathbb{R}^3$?

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| Standard V4. | Mark: |
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Let W be the set of all complex numbers $a + bi$ where $a = 2b$. Determine if W is a subspace of \mathbb{C} .

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| Additional Notes/Marks | |
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