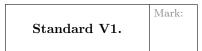
Name:	
J#:	Dr. Clontz
Date:	

## MASTERY QUIZ DAY 14

Math 237 – Linear Algebra Fall 2017

## Version 5

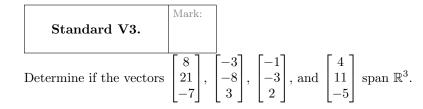
Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



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 this scalar multiplication  $\odot$  distributes over vector addition  $\oplus$ .
- (b) Determine if V is a vector space or not. Justify your answer.



Determine if 
$$\left\{ \begin{bmatrix} x \\ y \\ 0 \\ z \end{bmatrix} \mid x,y,z \in \mathbb{R} \right\}$$
 a subspace of  $\mathbb{R}^4$ .

Determine if the set 
$$\left\{ \begin{bmatrix} 0\\1\\1\\1 \end{bmatrix}, \begin{bmatrix} 1\\-1\\0\\2 \end{bmatrix}, \begin{bmatrix} 1\\0\\-1\\0 \end{bmatrix}, \begin{bmatrix} 0\\2\\0\\-1 \end{bmatrix} \right\}$$
 is a basis of  $\mathbb{R}^4$ .