| Name: |            |
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| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

Version 1

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.

| Standard V3.             | Mark:  |         |  |
|--------------------------|--|---------|--|
| Determine if the vectors | $\begin{bmatrix} 1 \\ 1 \\ 2 \\ 1 \end{bmatrix}, \begin{bmatrix} 3 \\ 3 \\ 6 \\ 3 \end{bmatrix}$ | 3, 3, 3 | $\begin{bmatrix} 7 \\ -1 \\ 8 \\ -3 \end{bmatrix} \text{ span } \mathbb{R}^4.$ |

Standard V4.

Mark:

Let W be the set of all  $\mathbb{R}^3$  vectors  $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$  satisfying x+y+z=1 (this forms a plane). Determine if W is a subspace of  $\mathbb{R}^3$ .

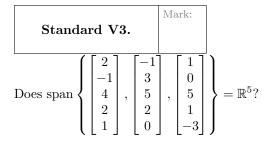
Determine if the set 
$$\left\{ \begin{bmatrix} 0\\1\\1\\1 \end{bmatrix}, \begin{bmatrix} 1\\-1\\0\\2 \end{bmatrix}, \begin{bmatrix} 1\\0\\-1\\0 \end{bmatrix}, \begin{bmatrix} 0\\2\\0\\-1 \end{bmatrix} \right\}$$
 is a basis of  $\mathbb{R}^4$ .

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Version 2

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|              | Mark: |
|--------------|-------|
| Standard V4. |       |
|              |       |

Let W be the set of all polynomials of even degree. Determine if W is a subspace of the vector space of all polynomials.

Standard S2.

Mark:

Determine if the set  $\left\{ \begin{bmatrix} 1\\1\\-1 \end{bmatrix}, \begin{bmatrix} 3\\-1\\1 \end{bmatrix}, \begin{bmatrix} 2\\0\\-2 \end{bmatrix} \right\}$  is a basis of  $\mathbb{R}^3$ 

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Version 3

Math 237 – Linear Algebra Fall 2017

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Standard V3.

$$\begin{bmatrix}
\begin{bmatrix} 2 \\ -1 \\ 4 \end{bmatrix}, \begin{bmatrix} 3 \\ 12 \\ -9 \end{bmatrix}, \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} -4 \\ 2 \\ -8 \end{bmatrix} = \mathbb{R}^3?$$

| Standard V4. | Mark: |
|--------------|-------|

Let W be the set of all complex numbers a + bi satisfying a = 2b. Determine if W is a subspace of  $\mathbb{C}$ .

Standard S2.

Mark:

Determine if the set  $\left\{ \begin{bmatrix} 1\\1\\-1 \end{bmatrix}, \begin{bmatrix} 3\\-1\\1 \end{bmatrix}, \begin{bmatrix} 2\\0\\-2 \end{bmatrix} \right\}$  is a basis of  $\mathbb{R}^3$ 

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Version 4

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Standard V3.

Mark:

$$\begin{bmatrix} 1 \\ 0 \\ 2 \\ 1 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \\ 0 \\ -3 \end{bmatrix}, \begin{bmatrix} 0 \\ 3 \\ 0 \\ -2 \end{bmatrix}, \text{ and } \begin{bmatrix} -1 \\ 1 \\ -1 \\ -1 \end{bmatrix} \text{ span } \mathbb{R}^4.$$

|              | Mark: |
|--------------|-------|
| Standard V4. |       |
|              |       |

Let W be the set of all complex numbers a + bi satisfying a = 2b. Determine if W is a subspace of  $\mathbb{C}$ .

Standard S2.

Mark:

Determine if the set  $\{x^2 + x - 1, 3x^2 - x + 1, 2x - 2\}$  is a basis of  $\mathcal{P}_2$ 

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Version 5

Math 237 – Linear Algebra Fall 2017

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Standard V3.

Mark:
$$\begin{bmatrix} -3 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 5 \\ -1 \\ -2 \end{bmatrix}, \begin{bmatrix} 2 \\ 0 \\ -1 \end{bmatrix}, \text{ and } \begin{bmatrix} 0 \\ 2 \\ -1 \end{bmatrix} \text{ span } \mathbb{R}^3$$

| Standard V4. | Mark: |
|--------------|-------|

Let W be the set of all complex numbers a + bi satisfying a = 2b. Determine if W is a subspace of  $\mathbb{C}$ .

Standard S2.

Mark:

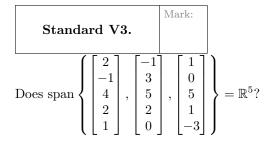
Determine if the set  $\left\{ \begin{bmatrix} 1\\1\\-1 \end{bmatrix}, \begin{bmatrix} 3\\-1\\1 \end{bmatrix}, \begin{bmatrix} 2\\0\\-2 \end{bmatrix} \right\}$  is a basis of  $\mathbb{R}^3$ 

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Version 6

Math 237 – Linear Algebra Fall 2017

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|              | Mark: |
|--------------|-------|
| Standard V4. |       |
|              |       |

Let W be the set of all polynomials of even degree. Determine if W is a subspace of the vector space of all polynomials.

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  $\mathcal{P}_3$