

Name:
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Date:

Dr. Clontz

### MASTERY QUIZ DAY 13

Math 237 – Linear Algebra

#### Version 3

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.

<b>Standard V2.</b>	Mark:
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Determine if  $\begin{bmatrix} 4 \\ -1 \\ 6 \\ -7 \end{bmatrix}$  belongs to the span of the set  $\left\{ \begin{bmatrix} 2 \\ 0 \\ -1 \\ 5 \end{bmatrix}, \begin{bmatrix} 4 \\ -1 \\ 4 \\ 3 \end{bmatrix} \right\}$ .

**Solution:** Since

$$\text{RREF} \left( \left( \begin{array}{cc|c} 2 & 4 & 4 \\ 0 & -1 & -1 \\ -1 & 4 & 6 \\ 5 & 3 & -7 \end{array} \right) \right) = \left( \begin{array}{cc|c} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{array} \right)$$

contains the contradiction  $0 = 1$ ,  $\begin{bmatrix} 4 \\ -1 \\ 6 \\ -7 \end{bmatrix}$  is not a linear combination of the three vectors.

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<b>Standard S1.</b>	Mark:
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Determine if the set of polynomials  $\{x^3 - 8x, x^3 + 2x^2 + 2, -x^2 + 3\}$  is linearly dependent or linearly independent

**Solution:**

$$\text{RREF} \left( \left( \begin{array}{ccc} -3 & 1 & 0 \\ -8 & 2 & -1 \\ 0 & 2 & 3 \\ 0 & 0 & 0 \end{array} \right) \right) = \left( \begin{array}{ccc} 1 & 0 & \frac{1}{2} \\ 0 & 1 & \frac{3}{2} \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{array} \right)$$

This has a non pivot column, therefore the set is linearly dependent.

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<b>Additional Notes/Marks</b>	
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