Name:
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Date:

Dr. Clontz

MASTERY QUIZ DAY 22 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.

Standard A1.	Mark:

Let $T:\mathbb{R}^3\to\mathbb{R}^4$ be the linear transformation given by

$$T\left(\begin{bmatrix}x\\y\\z\end{bmatrix}\right)=\begin{bmatrix}-3x+y\\-8x+2y-z\\7x+2y+3z\\0\end{bmatrix}.$$

Write the matrix for T with respect to the standard bases of $\mathbb{R}^3$ and $\mathbb{R}^4$.

Solution:

$$\begin{bmatrix}3&1&0\\-8&2&-1\\7&2&3\\0&0&0\end{bmatrix}$$

□

Standard A2.	Mark:

Determine if $D:\mathbb{R}^{2\times 2}\to\mathbb{R}$ given by $D\left(\begin{bmatrix}a&b\\c&d\end{bmatrix}\right)=ad-bc$ is a linear transformation or not.

Solution: $D(I)=1$ but $D(2I)=4\neq 2D(I)$, so D is not linear.

□

Standard M1.	Mark:

Let

$$C=\begin{bmatrix}2&3\\0&1\end{bmatrix}\qquad D=\begin{bmatrix}3&1&0\end{bmatrix}\qquad E=\begin{bmatrix}2&0\\0&-1\\1&-1\end{bmatrix}$$

Determine which of the six products CD, CE, DC, DE, EC, ED can be computed, and compute them.

Solution:

$$EC = \begin{bmatrix} 4 & 6 \\ 0 & -1 \\ 2 & 2 \end{bmatrix}$$

$$DE = \begin{bmatrix} 6 & -1 \end{bmatrix}$$

□

Additional Notes/Marks	