Philadelphia University

Department of Basic Sciences

Exam 1 **Linear Algebra 2** **13–11–2013**

1. (1 pt) Find the elementary matrix E such that

$$E \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} = \begin{bmatrix} 1 & 2 & 3 \\ 5 & 7 & 9 \\ 7 & 8 & 9 \end{bmatrix}$$

2. (2 pts) Evaluate $\det A$.

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 5 \\ 0 & 0 & 0 & 4 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \end{bmatrix}$$

3. (3 pts) Write $(3, 5)$ as a linear combination of $(1, 4)$ and $(2, 6)$, if possible.

4. (3 pts) Determine if these vectors are linearly dependent or independent in R^4.

$$\{(1, 0, 1, 0), (1, 1, 0, 0), (0, 1, 0, 1), (0, 0, 1, 1)\}$$

5. (5 pts) Write the matrix A as the product of elementary matrices.

$$A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ 0 & 0 & 5 \end{bmatrix}$$

6. (6 pts) Solve the system of equations using Gauss-Jordan algorithm.

$$\begin{cases} 5x & +y & -z & +3w & = 0 \\ & +y & -2z & -w & = 3 \\ x & -y & +2z & +w & = -1 \end{cases}$$

–Amin Witno