Name Solution Key

UNIVERSITY OF WYOMING — Math 2250—Fall 2023 — Department of Mathematics

Elementary Linear Algebra

Quiz 7

Friday, October 26, 2023

Consider the 3×4 matrix

$$A = \begin{bmatrix} 1 & 5 & 2 & 0 \\ 0 & 1 & 7 & 4 \\ 0 & 0 & 3 & 6 \end{bmatrix}.$$

In each case, find the *elementary matrix* E_i for the indicated elementary row operation.

1. If $E_1 A = \begin{bmatrix} 1 & 5 & 2 & 0 \\ 0 & 3 & 21 & 12 \\ 0 & 0 & 3 & 6 \end{bmatrix}$, then $E_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

(multiply row 2 by 3)

2. If $E_2 A = \begin{bmatrix} 1 & 0 & -33 & -20 \\ 0 & 1 & 7 & 4 \\ 0 & 0 & 3 & 6 \end{bmatrix}$, then $E_2 = \begin{bmatrix} 1 & -5 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

(subtract 5 times row 2 from row 1)

3. If $E_3 A = \begin{bmatrix} 0 & 0 & 3 & 6 \\ 0 & 1 & 7 & 4 \\ 1 & 5 & 2 & 0 \end{bmatrix}$, then $E_3 = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

(interchange rows 1 and 3)