

There are 6 possible types of a 2×3 matrix in reduced row-echelon form:

1.

$$\begin{bmatrix} 1 & 0 & a_{13} \\ 0 & 1 & a_{23} \end{bmatrix}$$

2.

$$\begin{bmatrix} 1 & a_{12} & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

3.

$$\begin{bmatrix} 1 & a_{12} & a_{13} \\ 0 & 0 & 0 \end{bmatrix}$$

4.

$$\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

5.

$$\begin{bmatrix} 0 & 1 & a_{13} \\ 0 & 0 & 0 \end{bmatrix}$$

6.

$$\begin{bmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$$