

Problem 1

Which of the following matrices are in reduced row-echelon form?

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 0 & 0 & 8 \\ 0 & 1 & 0 & 5 \\ 0 & 0 & 1 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 5 \\ 0 & 0 & 1 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 0 & 0 & 2 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 2 & 3 & 4 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

Problem 2

Determine a condition on a , b and c so that the following system has solutions:

$$2x + y + z = a$$

$$x - 2y + z = b$$

$$3x - y + 2z = c$$

Problem 3

Let $A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 \\ 3 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$. If possible, compute $A + B$, $3A - 2B$, AB , BA , AC and CA .