I.
$$|Q|$$

$$A = \begin{pmatrix} 1 & 0 & -1 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

A: $4\times3 \times 3\times1 \quad \vec{0}: 3\times1$

I. $|Q4$

$$\vec{x} = \begin{pmatrix} 1 \\ -2 \end{pmatrix} \quad \vec{y} = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$$

There is no $3\text{rd} \quad \vec{z} \in \mathbb{R}^3$ with $Az=0$ and $\vec{x}, \vec{y}, \vec{z}$ are independent. If there were, then combinations of $\vec{x}, \vec{y}, \vec{z}$ would induce that $\forall \vec{w} \in \mathbb{R}^3$ salves $Aw=0$, contradiction!

I. $|Q9|$

If
$$C(A) = \mathbb{R}^3$$
, then $r=3$, $m \ge 3$, $n \ge 3$

I | Q9
If
$$C(A) = \mathbb{R}^3$$
, then $r=3$, $m \ge 3$, $n \ge 3$

If
$$C(A) = \mathbb{R}^3$$
, then $r=3$, $m>3$, $n>3$

If
$$C(A) = \mathbb{R}^3$$
, then $r=3$, $m \ge 3$, $n \ge 3$
I.1 Q18

If
$$C(A) = \mathbb{R}^3$$
, then $Y=3$, $M \ge 3$, $N \ge 3$

I.1 Q18

If
$$C(A) = \mathbb{R}^3$$
, then $r=3$, $m>3$, $n>3$

$$A) = \mathbb{R}^3$$
, then $r=3$, $m>3$, $n>3$

If
$$C(A) = \mathbb{R}^3$$
, then $r=3$, $m>3$, $n>3$

If
$$A=CR$$
, then $\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix} = \begin{bmatrix} C \\ C \end{bmatrix}$

If
$$A=CR$$
, then $\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix} = \begin{bmatrix} C \\ - \end{bmatrix}$

If
$$A=CR$$
, then $\begin{bmatrix} O & A \\ O & A \end{bmatrix}_{2m\times(n+1)} = \begin{bmatrix} C \\ C \end{bmatrix}_{2m\times(n+1)} \begin{bmatrix} O & R \end{bmatrix}_{P\times(n+1)}$

If
$$A = CR$$
, then $\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \\ C \end{bmatrix}_{2m \times (n+1)}$

If
$$A = CR$$
, then $\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \\ C \end{bmatrix}_{2m \times k}$

then
$$\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \\ C \end{bmatrix}_{2m \times r}$$

Aman Cox Rran
$$\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \\ C \end{bmatrix}_{2m \times 1}$$

$$\begin{bmatrix} 0 & A \\ 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \\ C \end{bmatrix}_{2m \times p} \begin{bmatrix} 1 & 1 & 1 \\ 2m & 1 & 1 \end{bmatrix}$$

Aman Constr Risk
$$\begin{bmatrix} 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \\ 2m \times C \end{bmatrix}_{2m \times C}$$

Amxii Cmxr Rrxn
$$\begin{bmatrix} 0 & A \end{bmatrix}_{2m \times (n+1)} = \begin{bmatrix} C \end{bmatrix}_{2m \times r}$$