Show your work. Fill in the appropriate blanks

A set of 4 vectors (a1 a2 a3 a4) row reduces to $\begin{pmatrix} 1 & 2 & 0 & 1 \\ 0 & 0 & 1 & 5 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$ Q1) Circle pivot as $\begin{pmatrix} 1 & 2 & 0 & 1 \\ 0 & 0 & 1 & 5 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$

- Q1) Circle pivot columns and put a box around pivot entries.
- Q2) Are the vectors LI?
- Q3) The pivot variables are
- Q4) The free variables are X2 X4

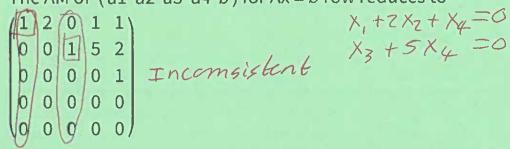
Q5) Write down a formula for all solutions to Ax = 0.

$$X = \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} + \begin{pmatrix} -2 \\ 1 \\ 0 \\ -1 \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \\ -5 \\ 1 \end{pmatrix} + \begin{pmatrix} 0 \\ 1 \\ 0 \\ -5 \\ 1 \end{pmatrix}$$

- Q6) Fill in any pivot columns. $\left(\frac{a_1}{a_3}, \frac{a_3}{a_3}, \frac{a_3}{a_3}\right)$
- Q7) Write down two different non-trivial solutions to Ax = 0.

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The AM of (a1 a2 a3 a4 b) for Ax = b row reduces to



- Q1) Circle pivot columns and put a box around pivot entries.
- Q2) Are the vectors (a1 a2 a3 a4) LI? NO
- Q3) The pivot variables are χ_{i} χ_{3}
- Q4) The free variables are X2 X4
- Q5) Write down a formula for all solutions to Ax = b.

$$X = \begin{pmatrix} X_1 \\ X_2 \\ X_4 \\ X_4 \end{pmatrix} = \begin{pmatrix} X_1 \\ X_2 \\ X_4 \\ X_4 \end{pmatrix} + \begin{pmatrix} X_1 \\ X_4 \\ X_4 \\ X_4 \end{pmatrix} + \begin{pmatrix} X_1 \\ X_4 \\ X_4 \\ X_4$$

Q6) Fill in any pivot columns. $\begin{bmatrix} a_1 \\ a_2 \end{bmatrix}$

Q7) Write down two different non-trivial solutions to Ax = 0.

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Q1) Explain how to invert a square matrix A.

Q2) If the matrix
$$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 2 & 4 & 8 \end{pmatrix}$$
 is invertible complete

$$A^{-1} = \begin{pmatrix} 0 & -2 & 1/2 \\ -2 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$$

write DNE in the splace for the matrix in the inverse does Not Exist!

$$In[2]:= Inverse \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 2 & 4 & 8 \end{bmatrix} // MatrixForm$$

$$Out[2]//MatrixForm= \begin{pmatrix} 0 & 0 & 1 \\ 0 & -2 & \frac{1}{2} \\ -2 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 &$$