Homework 3 Solutions CAS CS 132 Fall 7024 Problem 1 [01-31] Explanation (Not Required): Two RREF has form

Solve for a, b, c and d.

distinct planes intersect at a line so we know there is exactly one free variable. The RREF cannot have a pirot in the third column because 2 has different values in the two given solutions, So the [0 1 b d]

Problem 2.1

 $\begin{bmatrix} 10 & -47 & 31 & -14 & 42 \\ -33 & -1 & -32 & 22 & -23 \\ -5 & -2 & 11 & 12 & 98 \\ -30 & -25 & 39 & 42 & 11 \\ -3 & 24 & 25 & 3 & -87 \end{bmatrix}$

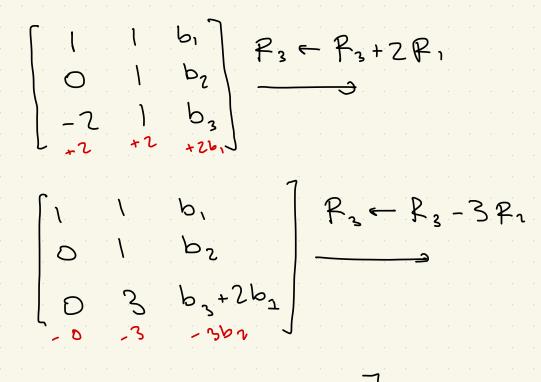
Not in the span

Problem 2.2

$$\begin{bmatrix} 10 & -47 & 31 & -14 & 87 \\ -33 & -1 & -32 & 21 & -19 \\ -5 & -2 & 11 & 12 & -24 \\ -30 & -25 & 39 & 42 & -61 \\ -3 & 24 & 25 & 3 & -79 \end{bmatrix}$$

$$\vec{\nabla} = \vec{V}_1 - 2\vec{V}_2 - \vec{V}_3 - \vec{V}_4$$

Problem 3.1)



$$\begin{bmatrix}
 0 & 1 & b_1 \\
 0 & 1 & b_2 \\
 0 & 0 & b_3 + 2b_1 - 3b_2
 \end{bmatrix}$$

$$\begin{bmatrix}
 2 \times_1 - 3 \times_2 + \times_3 = 0
 \end{bmatrix}$$

$$\begin{bmatrix}
1 & 0 & b_{1} \\
-6 & -1 & b_{3}
\end{bmatrix}$$

$$\begin{bmatrix}
1 & 0 & b_{1} \\
-6 & -1 & b_{3}
\end{bmatrix}$$

$$\begin{bmatrix}
-6 & -1 & b_{3} \\
+6 & +0
\end{bmatrix}$$

$$\begin{bmatrix}
1 & 0 & b_{1} \\
0 & 1 & b_{2} - b_{1}
\end{bmatrix}$$

$$\begin{bmatrix}
0 & b_{1} \\
0 & -1 & b_{3} + 5b_{1}
\end{bmatrix}$$

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\end{bmatrix}$$

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

Problem 3.2

Problem 4

$$x_{1} = 12 - 2 \times_{3} - 3 \times_{5}$$

$$x_{2} = 1 - 3 + 9 \times_{5}$$

$$x_{3} : \text{ free}$$

$$x_{4} = x_{5}$$

$$x_{5} : \text{ free}$$

$$x_{6} = -G$$

$$\begin{bmatrix} 4 & 7 & 1 & 13 \\ 9 & 3 & 1 & 25 \\ 4 & -7 & 1 & 5 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 0 & 7 \\ 0 & 1 & 0 & 7 \\ 0 & 0 & 1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & 0 & 7 \\ 0 & 0 & 1 \end{bmatrix}$$

= 2 x2 +2x +

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \sqrt{\frac{1}{2} - 1} \\ 0 & 0 & 1 & \sqrt{\frac{1}{2} - 1} \end{bmatrix}$$

 $Y = O x^{2} + \left(\frac{y-1}{x-1}\right) x + \frac{x-y}{x-1}$

Note: $\frac{x-y}{x-1} = 1 - \frac{y-1}{x-1} = y - \frac{x(y-1)}{x-1}$

Explanation: The points
$$(x,y)$$

 $(1,1)$ and $(\frac{x+1}{z}, \frac{y+1}{z})$ lie on a
line with slope $\frac{y-1}{x-1}$ and y -intercept

line with slope $\frac{\gamma-1}{x-1}$ and γ -intercept X-1 1-1. So the interpolation would

give the solution