RH 1.4

MATH 5, Jones

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Refrigerator Homework

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$$\begin{bmatrix} 1 & 3 & 1 & 0 \\ -4 & -9 & 2 & 0 \\ 0 & -3 & -6 & 0 \end{bmatrix} \to R_2 + = 4R_1 \to \begin{bmatrix} 1 & 3 & 1 & 0 \\ 0 & 3 & 6 & 0 \\ 0 & -3 & -6 & 0 \end{bmatrix} \to R_3 + = R_2, R_2/ = 3 \to \begin{bmatrix} 1 & 3 & 1 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$R_1 - = 3R_2 \to \begin{bmatrix} 1 & 0 & -5 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \to x_1 = 5x_3 \quad x_2 = -2x_3 \quad x_3 = x_3 \quad \boxed{\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = x_3 \begin{bmatrix} 5 \\ -2 \\ 1 \end{bmatrix}}$$

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$$\begin{bmatrix} 1 & 3 & -3 & 7 & 0 \\ 0 & 1 & -4 & 5 & 0 \end{bmatrix} \to R_1 - = 3R_2 \to \begin{bmatrix} 1 & 0 & 9 & -8 & 0 \\ 0 & 1 & -4 & 5 & 0 \end{bmatrix} \quad x_3 = s, \ x_4 = t$$

$$x_1 = 8t - 9s, \ x_2 = 4s - 5t, \ x_3 = s, \ x_4 = t \quad \boxed{\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = x_3 \begin{bmatrix} 9 \\ -4 \\ 1 \\ 0 \end{bmatrix} + x_4 \begin{bmatrix} 8 \\ -5 \\ 0 \\ 1 \end{bmatrix}}$$

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$$\begin{bmatrix} 1 & 3 & -5 & 4 \\ 1 & 4 & -8 & 7 \\ -3 & -7 & 9 & -6 \end{bmatrix} \to R_2 - = R_1, \ R_3 + = 3R_1 \to \begin{bmatrix} 1 & 3 & -7 & 4 \\ 0 & 1 & -3 & 3 \\ 0 & 2 & -6 & 6 \end{bmatrix}$$

$$R_3 - = 2R_2, \ R_1 - = 3R_2 \to \begin{bmatrix} 1 & 0 & 2 & -5 \\ 0 & 1 & -3 & 3 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad x_3 = t$$

$$x_1 = -5 - 2t, \ x_2 = 3 + 3t \quad \boxed{\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -5 \\ 3 \\ 0 \end{bmatrix} + x_3 \begin{bmatrix} -2 \\ 3 \\ 1 \end{bmatrix}}$$

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Line is y=-x-2 so the equation is $x = \begin{bmatrix} 0 \\ -2 \end{bmatrix} + \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

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False: Nontrivial means at least 1 is nonzero, not all of them

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No. The origin is where $b = 0$ in all dimensions, so b would need to equal 0

1 Computer Homework

1.1

1.2

1.3

1.4

1.5

1.6

1.7

1.8

1.9

1.10