TEXTBOOK: Linear Algebra
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READ: Sections 1.4

PROBLEMS:

1. Section 1.4: # 6, 10, 12, 18, 22, 23, 26, 27, 28, 29, 35, 36, 38, 39, 41, 42, 43, 44, 48, 52, 53, 54.

2. Find conditions on a, b so that the system has (i) no solution (ii) a unique solution and (iii) infinitely many solutions.

$$\begin{array}{rcrcrcl} x & + & 2y & - & z & = & 2 \\ 2x & + & 5y & - & 3z & = & 5 \\ 3x & + & 9y & + & az & = & b \end{array}$$

3. Suppose that the matrices A and H below are row equivalent.

$$A = \begin{bmatrix} 2 & 1 & x_3 & 1 & y_1 \\ 1 & -1 & 5 & 1 & y_2 \\ x_1 & 2 & 5 & -1 & y_3 \\ 0 & -1 & 2 & -1 & y_4 \\ 1 & x_2 & 3 & 1 & -2 \end{bmatrix} \sim \begin{bmatrix} 1 & 0 & 3 & 0 & 1 \\ 0 & 1 & -2 & 0 & 2 \\ 0 & 0 & 0 & 1 & -3 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix} = H$$

Find the values of $x_1, x_2, x_3, y_1, y_2, y_3, y_4,$. Fully explain your reasoning.