

Directions: You may work to solve these problems in groups, but all written work must be your own. Show all work; no credit for solutions without work..

1. Solve the following systems of linear equations. Verify that your solution is correct by substituting values back into their original equations.

(a)

$$\begin{array}{rclcrcl} x_1 & - & x_2 & = & 10 \\ 3x_1 & + & 2x_2 & = & -5 \end{array}$$

(b)

$$\begin{array}{rclcrcl} x_1 & + & x_2 & - & 2x_3 & = & 0 \\ & & 3x_2 & + & 2x_3 & = & 1 \\ 2x_1 & & & - & x_3 & = & 8 \end{array}$$

2. [1.1.{19,20}] Determine if the system is consistent. Do not fully solve.

(a)

$$\begin{array}{rclcrcl} x_1 & & & + & 3x_3 & = & 2 \\ & x_2 & & - & 3x_4 & = & 3 \\ & -2x_2 & + & 3x_3 & + & 2x_4 & = & 1 \\ 3x_1 & & & & & + & 7x_4 & = & -5 \end{array}$$

(b)

$$\begin{array}{rclcrcl} x_1 & & & - & 2x_4 & = & -3 \\ & 2x_2 & + & 2x_3 & & = & 0 \\ & & & x_3 & + & 3x_4 & = & 1 \\ -2x_1 & + & 3x_2 & + & 2x_3 & + & x_4 & = & 5 \end{array}$$

3. An augmented matrix with unknown entries.

- (a) Find an equation involving a , b , and c that makes the following augmented matrix correspond to a consistent system.

$$\left[\begin{array}{ccc|c} 1 & 2 & 4 & \\ 2 & 1 & 5 & \\ a & b & c & \end{array} \right]$$

- (b) Let $\mathcal{L}$ be the set of lines $ax_1 + bx_2 = c$ such that a , b , and c make the augmented matrix in part (a) consistent. Give a geometric description of $\mathcal{L}$.