

Activity 1.1.2 This activity considers sets of equations having three unknowns. In this case, we know that the solutions of a single equation form a plane. If it helps with visualization, consider using 3×5 -inch index cards to represent planes.

- a. Is it possible that there are no solutions to two linear equations in three unknowns? Either sketch an example or state a reason why it can't happen.
- b. Is it possible that there is exactly one solution to two linear equations in three unknowns? Either sketch an example or state a reason why it can't happen.
- c. Is it possible that the solutions to four equations in three unknowns form a line? Either sketch an example or state a reason why it can't happen.
- d. What would you usually expect for the set of solutions to four equations in three unknowns?
- e. Suppose we have a set of 500 linear equations in 10 unknowns. Which of the three possibilities would you expect to hold?
- f. Suppose we have a set of 10 linear equations in 500 unknowns. Which of the three possibilities would you expect to hold?