

Name:

OUID:

Instructions: Be sure to show as much work as possible, and please make a sincere effort to express your answers clearly and neatly. Please write your answers on your own paper, then staple your pages together using this sheet as a cover sheet.

1. [6 pts] Use Gaussian elimination to solve the following linear system:

$$x + y + 2z = -1$$

$$x \quad + z = 2$$

$$2x + y + 3z = 1$$

2. [6 pts] Find an equation relating a , b , and c so that the following linear system is consistent for any values of a , b , and c that satisfy that equation (note the relationship between this system and the one in the previous problem):

$$x + y + 2z = a$$

$$x \quad + z = b$$

$$2x + y + 3z = c$$

3. [6 pts] Determine all values of a for which the resulting linear system has (a) no solution; (b) a unique solution; (c) infinitely many solutions:

$$x + y + z = 2$$

$$x + 2y + z = 3$$

$$x + y + (a^2 - 5)z = a + 1$$

4. [3 pts] Is it possible for a system of three equations in two unknown to be consistent? If so, give an explicit example; if not, explain why not.