

Math 163 Introductory Seminar - Lehigh University - Spring 2008 - Assignment 3
Due Friday February 8

9. Consider the system of equations
$$\begin{array}{rcl} a_{11}x_1 + a_{12}x_2 & = & b_1 \\ a_{21}x_1 + a_{22}x_2 & = & b_2 \end{array}$$
 in the variables x_1 and x_2 .

Give a solution describing x_1 and x_2 in terms of the given values $a_{11}, a_{12}, a_{21}, a_{22}, b_1, b_2$ and state conditions on these values for which the (unique) solution exists. (Show work done in obtaining the solution. Do not just state it.)

10. Consider the answer to problem 9. When the conditions fail, give conditions on

$a_{11}, a_{12}, a_{21}, a_{22}, b_1, b_2$ so that

- (i) the system has infinitely many solutions
- (ii) the system has no solution.