Worksheet: Solving a System of Equations

ECON 441: Introduction to Mathematical Economics — Instructor: Div Bhagia

Given the system of equations:

$$4x_1 + 3x_2 = 28$$
$$2x_1 + 5x_2 = 42$$

Solve the above system of equations using matrix algebra. Start by writing out the equations in matrix format:

$$Ax = b$$

where A is the coefficient matrix, x is the vector of unknowns, and b is the vector of constants.

Then solve the equations using two methods:

1. Using the inverse of a matrix i.e.

$$x^* = A^{-1}b$$

2. Using Cramer's rule

$$x_k^* = \frac{|A_k|}{|A|}$$

   Here, A_k is the matrix formed by interchanging the k^{th} column of A by b.