MAT406H5F. Assignment 4, due October 19

Problem 1 of 5

Solve the following zero-sum game, i.e. find the value of the game and all optimal strategies for both players

$$\begin{pmatrix} 0 & 1 \\ 2 & -1 \\ -1 & 2 \\ 1 & 0.5 \end{pmatrix}.$$

Problem 2 of 5

Solve the following zero-sum game, i.e. find the value of the game and all optimal strategies for both players

$$\begin{pmatrix} 1 & 2 & -1 & 1 \\ -2 & -3 & -2 & 2 \\ -1 & 1 & 1 & 1 \end{pmatrix}.$$

Problem 3 of 5

Find an optimal strategy for Chris and the value of the game with the matrix

$$\begin{pmatrix} 0 & 1 & -1 & 1 \\ -1 & 0 & 1 & 1 \\ 1 & -1 & 0 & 1 \\ -1 & -1 & -1 & 0 \end{pmatrix}.$$

Problem 4 of 5

Solve the following zero-sum game, i.e. find the value of the game and all optimal strategies for both players

$$\begin{pmatrix} 1 & -2 & 2 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 1 & -2 \\ 0 & 0 & 0 & 1 \end{pmatrix}.$$

Problem 5 of 5

Prove that if Ruth has two different optimal strategies in a zero-sum game, then she has infinitely many optimal strategies in this game.
Hint: Prove that the set of all optimal strategies of Ruth in any finite zero-sum game is convex.