HW 15.8

Sunday, November 8, 2020 4:34 PM

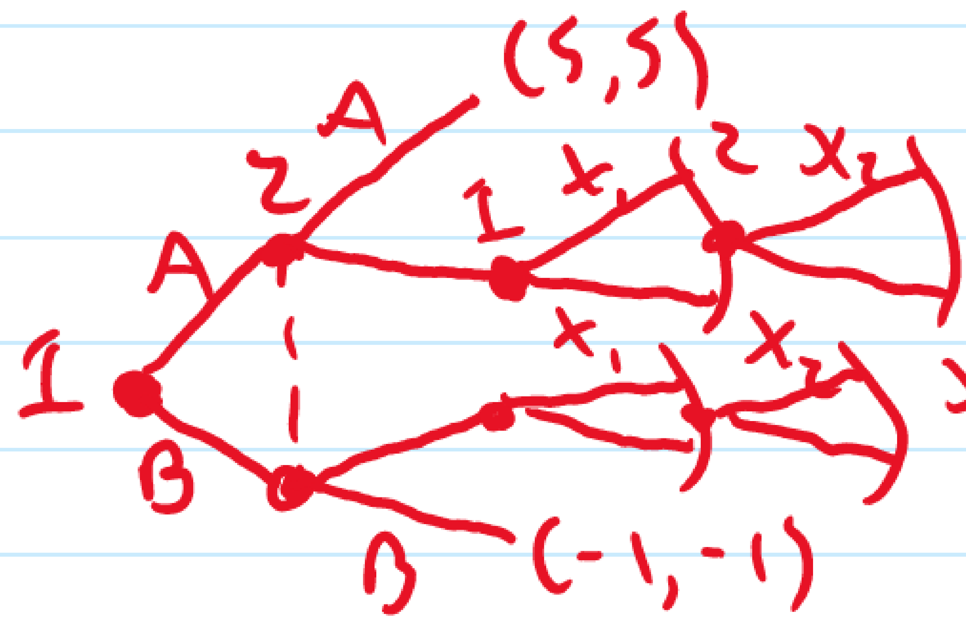
Passed Solution review

8. Imagine a game in which players 1 and 2 simultaneously and independently select A or B. If they both select A, then the game ends and the payoff vector is (5, 5). If they both select B, then the game ends with the payoff vector (−1, −1). If one of the players chooses A while the other selects B, then the game continues and the players are required simultaneously and independently to select positive numbers. After these decisions, the game ends and each player receives the payoff $(x_1 + x_2)/(1 + x_1 + x_2)$, where x_1 is the positive number chosen by player 1 and x_2 is the positive number chosen by player 2.

(a) Describe the strategy spaces of the players.

$S_i = \{A, B\} \times (0, \infty) \times (0, \infty)$

A and B are separate



$x_1+x_2/1+x_1+x_2 = z_1 \quad 0<z_1<1$

$x_1+x_2/1+x_1+x_2 = z_2 \quad 0<z_2<1$

(b) Compute the Nash equilibria of this game.

(A, A) is a NE but so is every other positive number because $(x_1+x_2)/(1+x_1+x_2)$ will be positive and is the same for both

B is never part of NE because any defection yields a higher payoff.

(c) Determine the subgame perfect equilibria.

$du/dx = 1/(1+x_1+x_2)^2 = 0$

↳ No solutions

According to b, they will choose the highest value possible

In the subgame each wants to select the largest possible value of x_i which isn't bounded. Thus any Aa_i with $a_i < \infty$ is not SPE