

Name: _____

Quiz #4 – EconS 301 (April 9th, 2026)

Question #1 (100 Points)

Consider the following 2x2 game

		Player 2	
		L	R
Player 1	L	6,6	2,7
	R	7,2	0,0

- Identify the pure strategy Nash equilibria of this game.
- Consider the probability β placed by player 1 on L and λ is player 2's probability of playing L, where $\beta, \lambda \in [0,1]$. Formulate the expected payoff of each player. Is there a mixed strategy Nash Equilibrium in this game?
- Draw the best-response correspondences. Where do they intersect?

Solution

- $NE = \{(L,R), (R,L)\}$
- Assume β is the probability that player 1 selects L and λ is the probability that player 2 selects L.
Hence:

$$EU_1(L) = 6\lambda + 2(1-\lambda) = 2 + 4\lambda$$

$$EU_1(R) = 7\lambda + 0(1-\lambda) = 7\lambda$$

Hence, player 1 chooses L if $EU_1(L) > EU_1(R)$. That is, if $2 + 4\lambda > 7\lambda$ or $\lambda < 2/3$.

In addition,

$$EU_2(L) = 6\beta + 2(1-\beta) = 2 + 4\beta$$

$$EU_2(R) = 7\beta + 0(1-\beta) = 7\beta$$

Hence, player 2 chooses L if $EU_2(L) > EU_2(R)$. That is, if $2 + 4\beta > 7\beta$ or $\beta < 2/3$.

Therefore players' best response function are :

$$R^1(\lambda) =$$

- L if $\lambda < 2/3$
- Randomizes between L & R ($\beta \in (0,1)$) if $\lambda = 2/3$
- R if $\lambda > 2/3$

$$R^2(\beta) =$$

- L if $\beta < 2/3$
- Randomizes between L & R ($\lambda \in (0,1)$) if $\beta = 2/3$
- R if $\beta > 2/3$

The MSNE is player 1 randomizes between L and R if $\lambda = 2/3$ and player 2 randomizes between L and R if $\beta = 2/3$.

c)

