Econ 8010 HW4

Due Tuesday, October 24

Nathan Yoder

University of Georgia

Fall 2017

1. Consider the following normal form game.

		2		
		a	b	c
1	A	$4,5$	$0,2$	$0,0$
	B	$3,2$	$3,0$	$3,2$
	C	$0,0$	$0,2$	$4,4$

   (a) Find all rationalizable strategies.

   (b) Find all Nash equilibria.

2. Consider the following normal form game.

		2		
		a	b	c
1	A	$4,4$	$0,2$	$0,0$
	B	$3,2$	$3,0$	$3,2$
	C	$0,0$	$0,2$	$4,4$

   (a) Find all rationalizable strategies.

(b) Find all Nash equilibria.

3. Consider the following normal form game.

		2			
		a	b	c	d
1	A	$6,0$	$3,3$	$1,5$	$6,3$
	B	$4,1$	$4,1$	$2,2$	$7,1$
	C	$2,4$	$2,3$	$5,2$	$2,0$
	D	$5,3$	$2,3$	$0,4$	$5,3$

(a) Find all rationalizable strategies.

(b) Find all Nash equilibria.

4. Two firms $i \in \{1,2\}$ engage in price competition in a differentiated product market. That is, their strategies are prices for their product $p_i \geq 0$. Consumers view the two firms' products as substitutes (but not perfect substitutes). The demand for firm 1's product is given by

$$Q_1(p_1, p_2) = \max\{12 - 2p_1 + p_2, 0\}$$

and the demand for firm 2's product is given by

$$Q_2(p_1, p_2) = \max\{12 - 2p_2 + p_1, 0\}$$

Firm 1 and firm 2 each produce at constant marginal cost of 4. Thus, their payoffs when they play (p_1, p_2) are

$$\pi_1(p_1, p_2) = (p_1 - 4)\max\{12 - 2p_1 + p_2, 0\}$$
$$\pi_2(p_1, p_2) = (p_2 - 4)\max\{12 - 2p_2 + p_1, 0\}$$

Solve for the pure strategy Nash equilibrium.