

Review questions for the exam for ECON 476. The review sheet is all of the help sheets.

1) (20 points) Find all Nash equilibria in the following matrix. Prove that you found all and prove they are Nash equilibria. Does either firm have a dominant strategy? Explain your logic. Find the cooperative equilibrium. Explain how you found it. What are the two players' secure strategies? How did you find them?

Payoff Matrix		Sony		
		High price	Medium Price	Low Price
Yamaha	High Price	25	24	22
	Low Price	19	36	33
Sony	High Price	7	20	23
	Low Price	18	11	35

2) (15 points) Create a 2x2 payoff matrix which has no pure Nash equilibria. Prove it has no equilibria.

3) (10 points) We have only examined one-shot Nash games. Repeated games, where you play against the same opponent over and over again (like two firms selling products) have different results. Explain why repeating the game makes a difference.

4) (5 points) If I gave you a 7x13 payoff matrix, then what is the maximum number of Nash equilibria we could have assuming all numbers are different? Explain your logic.

5) (30 points) Suppose your utility function is given by $U(C_0, C_1, C_2) = 4C_0^{1/4}C_1^{1/4}C_2^{1/4}$. Your income is \$210 this year and \$330 next year and nothing in the last year. If the interest rate is 10%, find utility maximizing consumption for the three years.

6) (30 points) Suppose your utility function for cats (C), dogs (D), and elephants (E) is given by $U(C, D, E) = C^{1/6}D^{1/3}E^{1/6}$. The price of a cat is \$20/cat. The price of a dog is \$10/dog. And the price of an elephant is \$80/elephant. Your budget is \$340. Cats take care of themselves, so require no time. Dogs require $\frac{1}{2}$ hour walk per day. Elephants require 4 hours of care per day including shoveling manure. You have 12 hours per day. Find the profit maximizing number of each pet.