

Game Theory

Exercise 1 : Pure Equilibria

Find all the Nash equilibria in the following games :

	G	D
H	2,2	0,1
B	1,0	1,1

	G	D
H	1,1	0,0
B	0,0	1,1

	G	D
H	2,2	0,0
B	0,0	1,1

	G	D
H	0,0	3,1
B	1,3	2,2

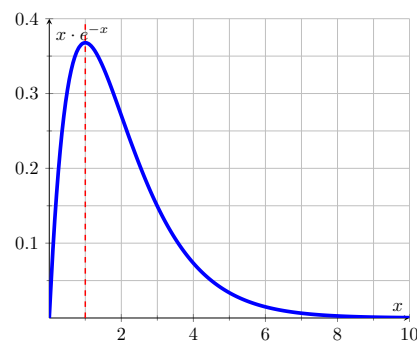
Exercise 2 : Mixed Equilibria

Explain why in the following game the pair of mixed strategies where

- the row player plays H with probability $\frac{3}{4}$, M with probability 0 and B with probability $\frac{1}{4}$
 - the column player plays G with probability 0, C with probability $\frac{1}{3}$ and D with probability $\frac{2}{3}$
- is a Nash equilibrium (each $*$ represents an unknown utility).

	G	C	D
H	$*$,2	3,3	1,1
M	$*$, $*$	1, $*$	2, $*$
B	$*$,4	5,1	0,7

Exercise 3



We consider n farmers who can each produce at no cost as much wheat as they want. If the k th farmer produces q_k , the total quantity produced is $Q = q_1 + q_2 + \dots + q_n$. The price of wheat will then be $p = e^{-Q}$.

1. Show that the individual strategy of producing one unit of wheat is dominant for each farmer. From this deduce that the profit for each farmer is e^{-n} .
2. Suppose that the farmers reach an explicit agreement where in total 1 unit of wheat is produced. Show that in this case the total profit is maximal. Would this happen in the absence of an explicit contract?