$v^- = \text{Max Min } X A Y^t$ X is player 1's mixed strategy

$v^+ = \text{Min Max } X A Y^t$ Y " " 2's " "

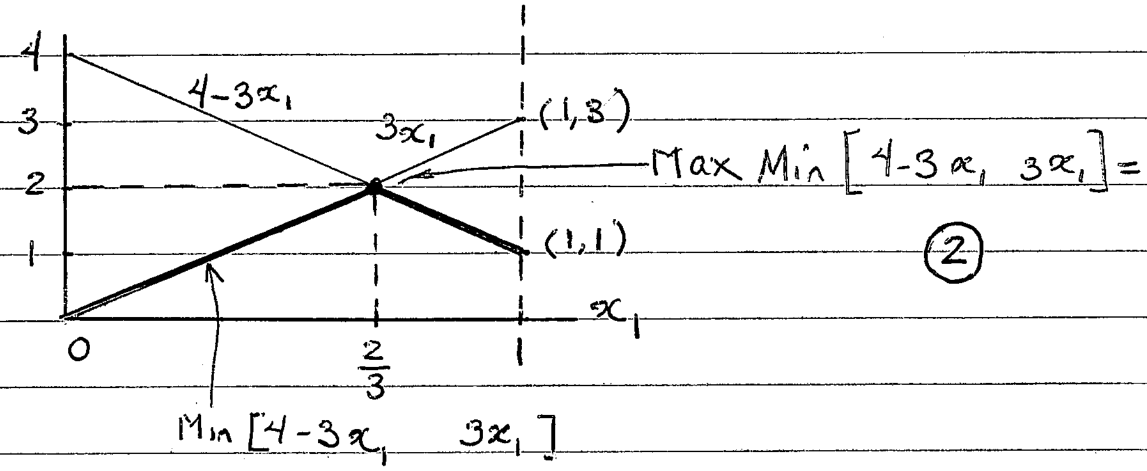
E.g. $A = \begin{bmatrix} 1 & 3 \\ 4 & 0 \end{bmatrix}$

$$v^- = \underset{M}{M} [x_1 \ \ x_2] \begin{bmatrix} 1 & 3 \\ 4 & 0 \end{bmatrix} Y^t$$

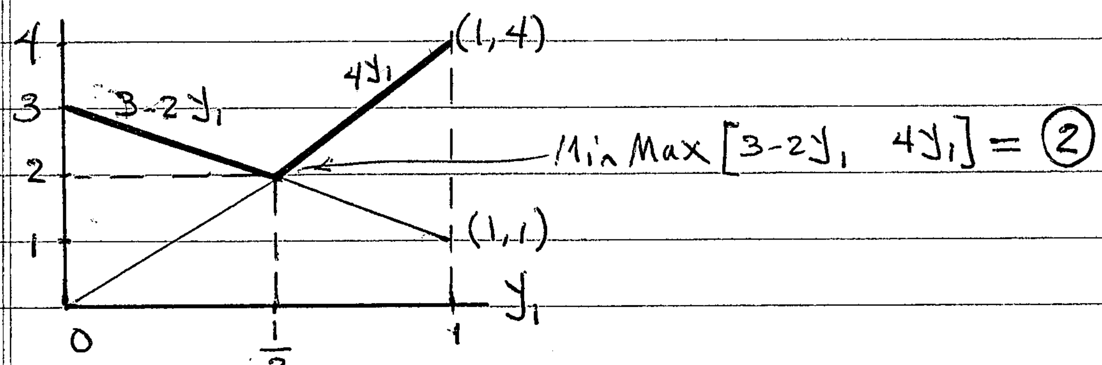
$$= \underset{M}{M} [x_1 + 4x_2 \quad 3x_1] \, Y^t \qquad \text{note } x_2 = 1 - x_1$$

$$= \underset{M}{M} [x_1 + 4(1 - x_1) \quad 3x_1] \, Y^t$$

$$= \underset{M}{M} [4 - 3x_1 \quad 3x_1] \, Y^t$$



$$v^+ = \underset{M}{M} [3 - 2y_1 \quad 4y_1]$$



Hexmoor
2010

Non Zero-Sum games

E.g. 1

	t_1	t_2
S_1	0,0	12,−12
S_2	−12,12	6,6

(6,6) — non zero sum payoffs

E.g. 2

	t_1	t_2
S_1	0,0	1,1
S_2	1,1	0,0

We Permit Pregame Communication or repeated plays
This will Produce Cooperation and Choice of 1,1 Payoffs

E.g. 3

	t_1	t_2
S_1	10,1	2,2
S_2	2,2	1,10

I Prefers 10,1 so chooses S_1
II " 1,10 " " t_2
} ⟹ ~~(2,2) is their Payoff~~

players could understand the Conflict over repeated play & alternate to get 10+1=1 units ~~bet~~
However, each has an incentive to deviate for a better Payoff
this game is incoercible.

E.g. 4

	t_1	t_2
S_1	1,10	10,1
S_2	0,−10	10,−9

(1,10) — 2's Choice; (10,1) — 1's choice

I hates S_2, I Can demand II to play t_2 with threat of S_2.

Transferable utility -- players could negotiate side payments.

E.g. 5

	t_1	t_2
s_1	50,0	1,5
s_2	1,0	1,5

Without side payments, II will choose t_2.
With " " , I can share 50 with II, so II will choose t_1.

E.g. 6

	t_1	t_2
s_1	10,1	0,0
s_2	0,0	1,10

If I & II coordinate (pre game negotiate) mixed strategies $\frac{1}{2}$ for each strategy, EU = (5.5, 5.5)

without cooperation (i.e. pre game strategizing),

If $X = Y = [\frac{1}{2}\ \frac{1}{2}]$ independently,

$$\left(XAY^T, XBY^T\right) = \left(\frac{11}{4}, \frac{11}{4}\right)$$

A ↑ I's game matrix; B ↑ II's game matrix; 2.75 2.75