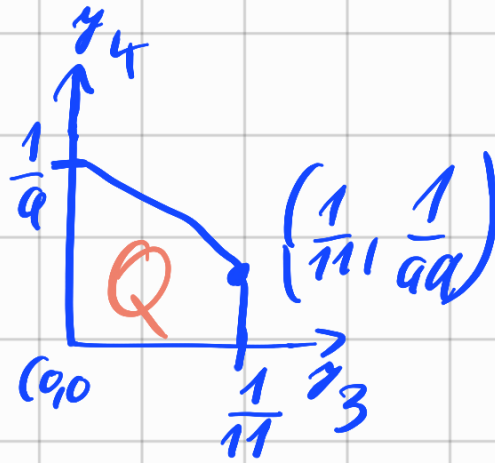
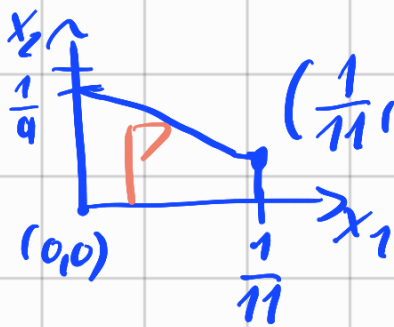


Game of chicken

$$M = \begin{pmatrix} 10 & 9 \\ 11 & 0 \end{pmatrix} = N^T$$



$$A_1 = \{1, 2\}$$

$$A_2 = \{3, 4\}$$

ALGEBRAIC

GEOMETRIC

STEP 0.

$$10x_1 + 9x_2 \leq 1$$

$$11x_1 \leq 1$$

$$10y_3 + 9y_4 \leq 1$$

$$11y_3 \leq 1$$

STEP 1.

SLACK VARS

$$\mu_1, \mu_2, \rho_3, \rho_4 \geq 0$$

$$\rho_3 = 1 - 10x_1 - 9x_2$$

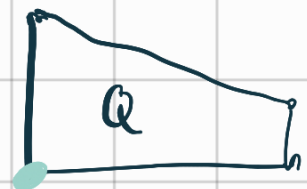
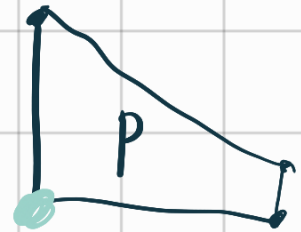
$$\rho_4 = 1 - 11x_1$$

$$\mu_1 = 1 - 10y_3 - 9y_4$$

$$\mu_2 = 1 - 11y_3$$

Schematically

STEP 1
start at •



Begin with Label $\boxed{1}$

IN x_1 (Min ratio is $\frac{1}{11}$)

$$a_3 = \frac{1}{11} - 9x_2 - \frac{10}{11}a_4$$

$$x_1 = \frac{1}{11} - \frac{a_4}{11}$$

$$u_1 = 1 - 10y_3 - 9y_4$$

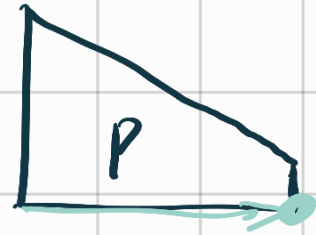
$$u_2 = 1 - 11y_3$$

OUT: label 4 $\Rightarrow a_4$

(*) MIN ratio

Test only from the variables having the coefficient negative

you can see that by setting all nonbasic variables (the ones on right hand side only) to zero



NOW we are here



AND here

\Rightarrow you can take just absolute value of ratios (only need to take coefficients which are negative).

STEP 2. } IN label 4 $\Rightarrow y_4$

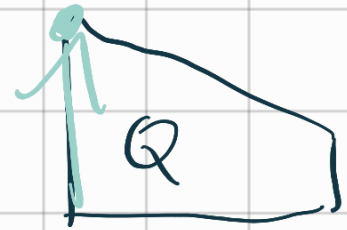
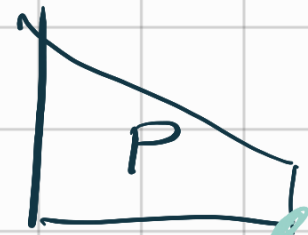
$$p_3 = \frac{1}{11} - 9x_2 - \frac{10}{11}p_4$$

$$x_1 = \frac{1}{11} - \frac{p_4}{11}$$

$$y_4 = \frac{1}{9} - \frac{10}{9}y_3 - \frac{m_1}{9}$$

$$m_2 = 1 - 11y_3$$

OUT m_1 (label 1)



here
are
the
new

↑
WE KNOW

that strategy

$$(x_1, x_2) = (1, 0)$$

$$(x_1, x_2) = (0, 1)$$

is NE

From homework

←
DROPPING LABEL

then corresponds to
the given pure strategy
(here y_3)

being played with
positive probability

→ END of algorithm

we dropped same label
as we began with (1)

⇒ we found NE

Starting with another label
we could find other NE.