

2008/A2

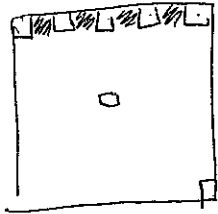
2010-10-19

①

Barbary: done 2 rows, or make all rows sum to 0.

$x \rightarrow -x$

VTRMC 2004/4



$$\text{White} = \text{black} + 1,$$

-3

$$= \text{black} - 2$$

2008/A3

Product conserved?

$$p_1^{r_1} p_2^{r_2} \dots p_k^{r_k}$$

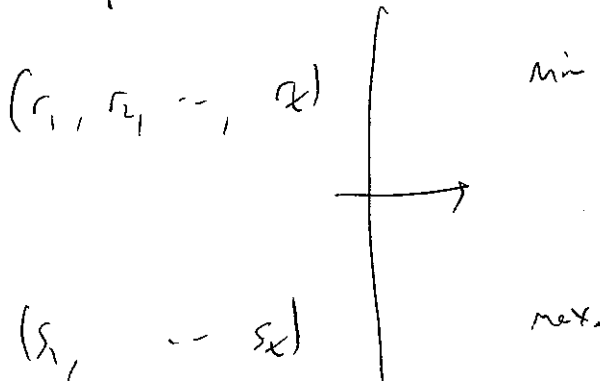
$$p_1^{s_1} p_2^{s_2} \dots p_k^{s_k}$$

$$\text{GCDs} = p_1^{\min(r_1, s_1)} \dots p_k^{\min(r_k, s_k)}$$

$$\text{LCM} = p_1^{\max(r_1, s_1)} \dots p_k^{\max(r_k, s_k)}$$

$$\min(r, s) + \max(r, s) = r + s \quad \text{OK}$$

See only t-tuples.



if not divides, then stuff may eventually run out of stuff

Each column sorts

TFF : Strategy stealing.

Suppose #2 has book : ~~#~~ given state of board, where to move next.

~~Sketch~~

Winning Strategy for #1 : steal book.

First move in random place.

~~then~~

let #2 move.

Look in book as if #2 was X, and ignore initial move.

↪ says where to go next. If on bad place (hit, move),
 more randomly

eventually win, and #2 can't win earlier.

Hence in any ~~book~~ $N \times N \times N \times \dots \times N$ the 2nd player ~~never~~
~~has no~~ never can win.

Ties?

TH (HALPERN-JEWETT) For given N , \exists D st. on N^D tic tac toe, no ~~draws~~ draws.

2002/02 Just need face of perimeter 4

If all perimeter = 3, then

$$3F = 3V$$

$$F = V.$$

$$V - E + F = 2$$

$$2V - E = 2$$

$$2V - 2 = E$$

$$2E = 3F.$$

$$\text{But } E = 3V - 6.$$

$$3V - 6 = 2V - 2.$$

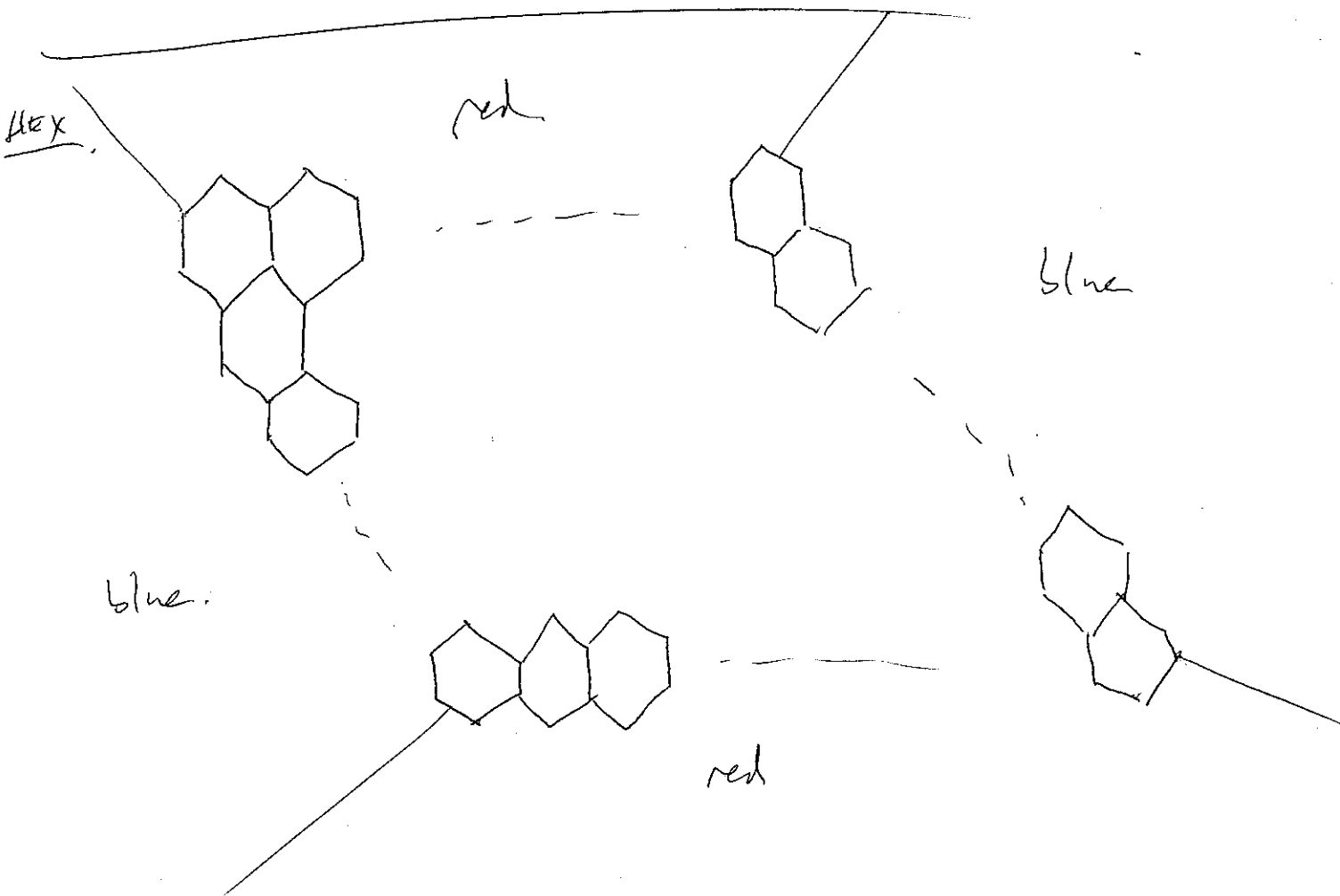
$$V = 4.$$

2002/84

2010-10-19
(3)

1 - 3 | 4 - 6 | 7 - 9
dl dl dl dl

2001 | 2002
v.



John Nash CMU, Master in 3 yrs

R.J. Duffin : letter of rec.

"This man is a genius."

