$$\begin{cases} -x \le 4 - \frac{2}{3}x \\ -x \le 4 + \frac{2}{3}x \\ 1 \le 4 - \frac{2}{3}x \\ 1 \le 4 + \frac{2}{3}x \end{cases} \Leftrightarrow \begin{cases} -\frac{1}{3}x \le 4 \\ -\frac{5}{3}x \le 4 \\ \frac{2}{3}x \le 3 \\ -\frac{2}{3}x \le 3 \end{cases} \Leftrightarrow \begin{cases} x \ge -12 \\ x \ge -\frac{12}{5} \\ x \le \frac{9}{2} \\ x \ge -\frac{9}{2} \\ x \le 2 \end{cases}$$

$$x \in \left[-\frac{12}{5}, 2\right]$$

37 What are the Voronoi cells of $\{(n, m) : n, m \in \mathbb{N}\} \subseteq \mathbb{R}^2$

SEMINAR 7

18.04.2018.

$a = (1\ 0\ 0\ 0\ 2\ 0)$
$b = (0\ 2\ 0\ 0\ 1)$
$c = (1\ 2\ 0\ 0\ 0)$
$d = (0\ 0\ 0\ 2\ 1)$

$A = a + \langle b, c \rangle$
$B = c + \langle b, d \rangle$
$\mathbb{R}^5$

$\text{aff}(A \cap B) = A \cap B$

$A \ni P_A(t, s) = a + tb + sc \qquad s, t \in \mathbb{R}$

$B \ni P_B(p, q) = c + pb + qd$

$P_A(t, s) = P_B(p, q)$

$P_A(t, 0) = P_B(t-1, 1)$

$\Rightarrow a + tb + sc = c + pb + qd$

$a + (t-p)b + (s-1)c - qd = 0$

$x = 1,\ y = -1,\ z = -1$

$$\begin{cases} 1 + y = 0 \Rightarrow y = -1 \\ 2x + 2y = 0 \Rightarrow x = 1 \\ 0 = 0 \\ 2 + 2z = 0 \Rightarrow 2z = -2 \Rightarrow z = -1 \end{cases}$$

$x + z = 0 \Rightarrow z = -x = -1$

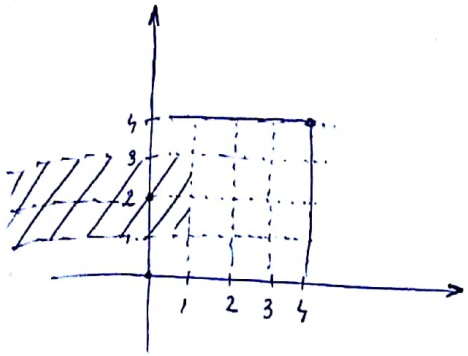
$$\begin{cases} t - p = 1 \Rightarrow t = 1 + p \\ s - 1 = -1 \Rightarrow s = 0 \\ -q = -1 \Rightarrow q = 1 \end{cases}$$

$A \cap B = a + \langle b \rangle$
$= c + \{(t-1)b + d;\ t\}$

$\text{aff}(A \cup B) = a + \langle b, c, d, c - a \rangle$

(37)(38) $M = \{(2m, 2m) : m, m \in N\} \subseteq R^2$

determine the Voronoi cells of $\begin{bmatrix} M \\ M \cup ((1;1) + M) \end{bmatrix}$



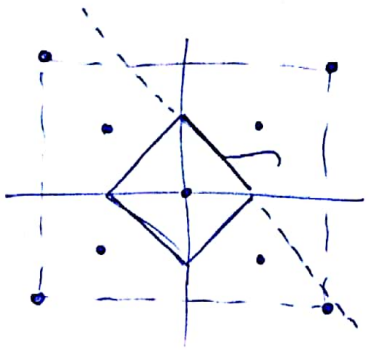
$f(2,2)$

$C_{(m,m)} = [m-1, m+1] \times [m-1, m+1]$

$C_{(0,m)} = (-\infty, m+1] \times [m-1, m+1]$

$C_{(0,0)} = (-\infty, 1] \times (-\infty, 1]$

$$C_{(2m,2m)} \begin{cases} x - y + c_1 \le 0 \\ x - y + (-2m + 1 - 2m) \ge 0 \\ x + y + (-2m - 2m - 1) \le 0 \\ x + y + (-2m - 2m + 1) \ge 0 \end{cases}$$



$2m + 1 + 2m + c_1 = 0$

$c_1 = -2m - 2m - 1$

$x - y - 2m + 2m - 1 \le 0$

$2m - 2m - 2m + 2m - 1 \le 0$

$-1 \le 0$

$2m + 2m - 2m - 2m - 1 \le 0$

(39)

(40) $f : X \to X$ X aff / k char $k \neq 2$

1). If f fixes A and $B \Rightarrow f$ fixes the line AB

2). f (midpoint of segment S) = midpoint of $f(S)$

3). f (parallelogram) is a parallelogram

4). f(plane) is a plane

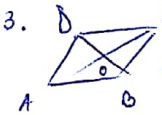
5). $L_1 \parallel L_2 \subseteq X$ $f(L_1) \parallel f(L_2)$

(lines)

1. $f(\text{Bar}(A; B; (1-t), t)) = \text{Bar}(f(A), f(B); 1-t, t)$

$f(A) = A$, $f(B) = B$

2. $[A, B]$ $t = \frac{1}{2}$

3. 

f(line) is a line

2. $\Rightarrow f(O)$ and for $[f(A) f(C)]$
$f(O)$ and for $[f(B) f(D)]$

$1 = \mu_1 + \mu_2 + \mu_3$

Bar $(f(A), f(B), f(C), \mu_1, \mu_2, \mu_3)$

f transf

so these are in general position