зад $\varphi_1 \leftrightharpoons \forall x \exists y \exists z (y \neq z \,\&\, q(x,z) \,\&\, q(x,y))$

$\varphi_2 \leftrightharpoons \forall x \forall z ((q(x,z) \Rightarrow p(x,z)) \,\&\, (p(x,z) \Rightarrow \neg p(z,x)))$

$\varphi_3 \leftrightharpoons \forall x \forall y \forall z (p(x,y) \,\&\, p(y,z) \Rightarrow p(x,z))$

$\varphi_4 \leftrightharpoons \forall x \forall y (h(x) \doteq h(y) \Rightarrow \neg q(x,y))$

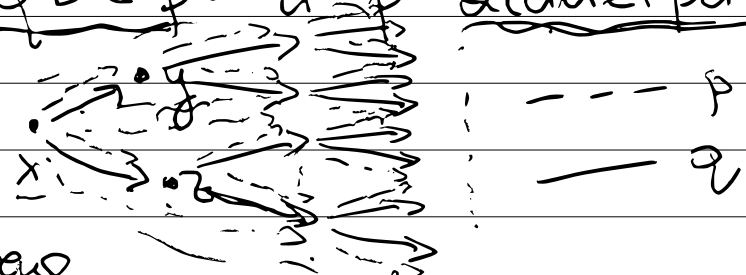
$\varphi_5 \leftrightharpoons \forall x \exists y (h(x) \doteq h(y) \,\&\, p(x,y))$

* q, p, h нелогически символи

φ_3 – транзитивност на p^t

φ_2 – $q^t \subseteq p^t$ и p^t асиметрична — антирефл. / антисим.

φ_1 –



q^t асиметрична свид.

φ_4 – q^t не е транзитивна (преки врезки при q^t)

φ_5 – етаж на x $\leq$ етаж на y

$h(x) = h(y)$

$\mathcal{A} \leq \langle$ безкрайно двойчено дерево $\{0,1\}^{\circledast}$; $p^{\mathcal{A}}, q^{\mathcal{A}}; h^{\mathcal{A}} \rangle$,

транзит. затв. по $q^{\mathcal{A}}$

$a \neq b$

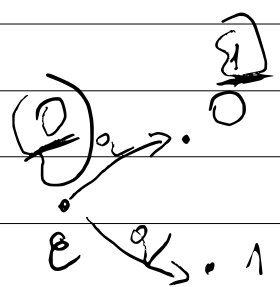
$\langle a, b \rangle \in p^{\mathcal{A}} \iff a$ е собствен префикс на b или

$|a| = |b|$ и $a \, d \, b$ по нивата за или зрезки

лексикографски

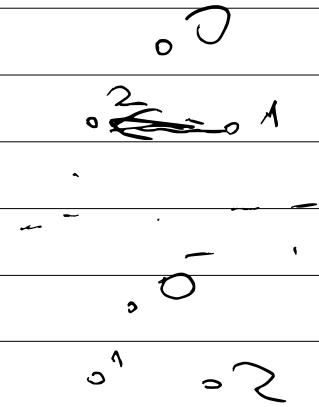
$\langle a, a \rangle \in q^{\mathcal{A}} \iff b = a0$ или $a1$

$$h^{\mathcal{A}}(a) \leq \begin{cases} a_1, & |a| = 2k+1 \rightsquigarrow a = a_1 d \\ & d \in \{0,1\} \\ \varepsilon, & |a| = 2k \end{cases}$$



? Ако $h^{\mathcal{A}}(\varepsilon) = 0$

$\mathcal{B} = \langle \mathbb{N}; p^{\mathcal{B}}, q^{\mathcal{B}}; h^{\mathcal{B}} \rangle$



$p^{\mathcal{B}} \leq \langle \mathbb{N}$

$h^{\mathcal{B}}(n) \leq n \% 3$

$q^{\mathcal{B}}(n) \leq p^{\mathcal{B}} \setminus \{\langle n, m \rangle \mid h^{\mathcal{B}}(n) = h^{\mathcal{B}}(m)\} =$

$\langle \mathbb{N}$

$$\begin{tikzcd} & n+1 \\ n \arrow[ur, "\neq"] \arrow[dr, "\neq"'] & \\ & n+2 \end{tikzcd}$$

$\varphi_1 \leftrightharpoons \forall x\,(\neg p(x,x) \,\&\, \exists y\,(p(x,y)) \,\&\, \forall y\,(p(x,y) \vee p(y,x) \vee x \doteq y))$

$\varphi_2 \leftrightharpoons \forall x \forall y\,(p(x,y) \Leftrightarrow \exists z\,(p(x,z) \,\&\, p(z,y)))$

$\varphi_3 \leftrightharpoons \forall x \forall y \forall z\,((p(x,y) \Leftrightarrow p(y,z)) \Rightarrow p(d(x,y), d(x,z)))$

$\varphi_4 \leftrightharpoons \forall x \forall y \forall z\,(p(d(x,z), y) \Rightarrow p(d(f(x), f(z)), y))$

$\varphi_5 \leftrightharpoons \forall x\,(p(x, f(x))) \,\&\, \forall x \forall y \forall z\,(\neg p(d(x,z), d(d(x,y), d(y,z))))$

$\Phi_1 \leftrightharpoons \{\varphi_1, \varphi_2, \varphi_3\}$

$\Phi_2 \leftrightharpoons \Phi_1 \cup \{\varphi_4\}$

$\Phi_3 \leftrightharpoons \Phi_2 \cup \{\varphi_5\}$

Кои са изпълними?

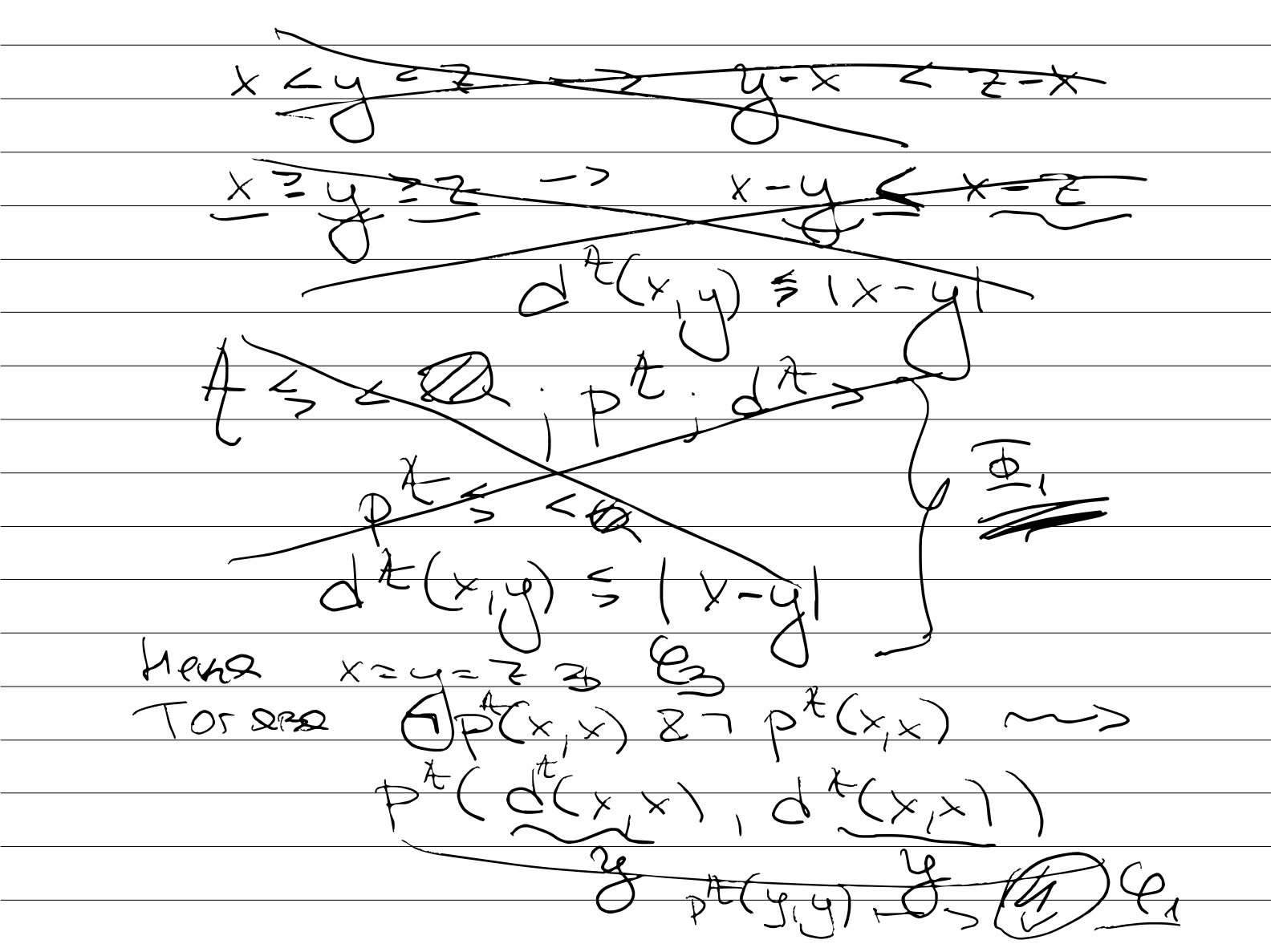
φ_1 – антирефл, сериална надесно, линейна p^A

φ_2 – гъстота, транзитивност p^A

φ_3 – $p^A(x,y) \,\&\, p^A(y,z) \to x<y<z \Rightarrow p^A(d^A(x,y), d^A(x,z))$

$\neg p^A(x,y) \,\&\, \neg p^A(y,z) \to x \geq y \geq z$

$\to \varnothing$, $< \varnothing$



$\cancel{x < y < z \to y - x < z - x}$

$\cancel{x \geq y \geq z \to x - y \leq x - z}$

$\cancel{d^t(x,y) \leq |x-y|}$

$\cancel{t \leq < \mathbb{Q}; p^t; d^t >}$

$\cancel{p^t \leq < \mathbb{Q}}$

$\cancel{d^t(x,y) \leq |x-y|}$

Φ_1

Нека $x = y = z$ з φ_3

Тогава $\neg p^t(x,x)$ & $\neg p^t(x,x) \rightsquigarrow$

$p^t(\underbrace{d^t(x,x)}_{y}, \underbrace{d^t(x,x)}_{y})$

$p^t(y,y) \to$ ↯ φ_1

Т.к. Φ_1 е неизп., то и Φ_2 и Φ_3 се неизп.