$$\mathcal{P}_m \ni p_m \text{ Pradikat-Symbole}$$

$$\text{Primformeln } \mathcal{P}\overline{O \cup X} = \frac{p_m t_1 \cdot\cdot t_m}{p_m \in \mathcal{P}_m: \quad t_i \in \overline{\overline{O \cup X}}}$$

$$\text{Symbol alg } < \mathcal{P}\overline{O \cup X} | \neg : \underset{x}{\sharp} | \sharp > \begin{cases} p_m t_1 \cdot\cdot t_m \\ \neg \\ \sharp \\ \underset{x}{\sharp} \end{cases}$$

$$\text{1-stellig } \begin{cases} \neg \text{ non} & \neg A = \bar{A} \\ \bigwedge_x & x \in X \\ \bigvee_x & x \in X \end{cases} \quad \text{Quantoren } \underset{x}{\sharp} = \begin{cases} \underset{x}{\wedge} \\ \underset{x}{\vee} \end{cases}$$

$$\text{2-stellig Junktoren } \begin{cases} \wedge & \text{und} \\ \vee & \text{oder} \\ \rightarrow & \text{implies} \end{cases} \begin{cases} \wedge AB = A \wedge B \\ \vee AB = A \vee B \\ \rightarrow AB = A \rightarrow B \end{cases} \quad \sharp = \begin{cases} \wedge \\ \vee \\ \rightarrow \end{cases}$$

$$\text{Formeln=ableitbar } \overline{\overline{\mathcal{P}\overline{O \cup X}}}$$

$$\text{Variablen=Zahlen } F_0 = \underset{\text{null}}{0} : \quad F_1 = \underset{\text{next}}{+1} : \quad F_2 = \underset{\text{add}}{+} : \quad F_2' = \underset{\text{mult}}{\bullet} : \quad P_2 = \underset{\text{gleich}}{=} : \quad P_2' = \underset{\text{kleiner}}{<}$$

$$x < y \Rightarrow \bigwedge_z x + z < y + z: \quad \text{Formel } \rightarrow \underbrace{< xy}_{\text{prim}} \bigwedge_z \underbrace{< \overbrace{+xz}^{\text{term}} \overbrace{+yz}^{\text{term}}}_{\text{prim}}$$

$$\text{Variablen=Mengen } F_0 = \underset{\text{leer}}{\varnothing} : \quad F_2 = \underset{\text{union}}{\cup} : \quad F_2' = \underset{\text{schnitt}}{\cap} : \quad P_2 = \underset{\text{gleich}}{=} : \quad P_2' = \underset{\text{element}}{\in}$$

$$X \neq Y \Rightarrow \overbrace{\bigvee_Z Z \in X \llcorner Y} \vee \overbrace{\bigvee_W W \in Y \llcorner X}: \quad \text{Formel } \rightarrow \neg \underbrace{= XY}_{\text{prim}} \vee \bigvee_Z \wedge \underbrace{\in ZX}_{\text{prim}} \neg \underbrace{\in ZY}_{\text{prim}} \bigvee_W \wedge \underbrace{\in WY}_{\text{prim}} \neg \underbrace{\in WX}_{\text{prim}}$$

$$\bigwedge A \in \overline{\mathcal{P}\overline{O \cup X}} \bigvee_{\text{Trg}}^{\text{eind}} |A| \subset X \text{ finit } \begin{cases} |p_m t_1 \cdot\cdot t_m| = |t_1| \cup \cdot\cdot \cup |t_n| \\ |\bar{A}| = |A| \\ |A \sharp B| = |A| \cup |B| \\ |\underset{x}{\sharp} A| = |A| \llcorner x = \dfrac{y \in |A|}{y \neq x} \end{cases}$$

$$\text{fin subset } Y \in 2_0^X \ni \begin{cases} \widetilde{\overbrace{p_m t_1 \cdot\cdot t_m}} = |t_1| \cup \cdot\cdot \cup |t_n| \\ \tilde{\neg} A|Y = Y \\ \tilde{\sharp} \underbrace{A_1|Y_1 : A_2|Y_2} = Y_1 \cup Y_2 \\ \underset{x}{\tilde{\sharp}} A|Y = Y \llcorner x \end{cases}$$

$$\overset{\text{Rek}}{\underset{\text{Satz}}{\Longrightarrow}} \bigvee_{*} |S_n A_1 \cdot\cdot A_n| = \tilde{S} \underbrace{A_1 : |A_1| \cdot\cdot A_n : |A_n|}$$

$$\text{Formel } A \text{ Satz } \Leftrightarrow |A| = \varnothing$$

$$\neg \bigwedge_X \in XY \text{ kein Mengen-Satz}$$

$$|\neg \bigwedge_X \in XY| = |\bigwedge_x \in XY| = |\in XY| \llcorner X = |X| \cup |Y| \llcorner X = X \cup Y \llcorner X = Y$$

$$\neg \bigwedge_x \neg \bigvee_y < yx \text{ Zahlen-Satz}$$

$$|\neg \bigwedge_x \neg \bigvee_y < yx| = |\bigwedge_x \neg \bigvee_y < yx| = |\neg \bigvee_y < yx| \llcorner x = |\bigvee_y < yx| \llcorner x$$
$$= |< yx| \llcorner y \llcorner x = |y| \cup |x| \llcorner y \llcorner x = y \cup x \llcorner y \llcorner x = \varnothing$$

$$\bigwedge A \in \overline{\mathcal{P}\overline{O \cup X}} \bigvee_{\text{rang}}^{\text{eind}} \text{ rg } A \in \mathbb{N} \begin{cases} \text{rg } p_m t_1 \cdot\cdot t_m = 0 \\ \text{rg } \bar{A} = 1 + \text{ rg } A \\ \text{rg } \underset{x}{\sharp} A = 1 + \text{ rg } A \\ \text{rg } A \sharp B = 1 + \text{ rg } A + \text{ rg } B \end{cases}$$

$$k \in \mathbb{N} \ni \begin{cases} \overbrace{p_m t_1 \cdot\cdot t_m}^{\sim} = 0 \\ \tilde{\neg} \begin{bmatrix} A & k \end{bmatrix} = 1 + k \\ \underset{x}{\tilde{\sharp}} \begin{bmatrix} A & k \end{bmatrix} = 1 + k \\ \tilde{\sharp} \overbrace{\underbrace{A_1 | k_1} \underbrace{A_2 | k_2}} = 1 + k_1 + k_2 \end{cases}$$

$$\overset{\text{Rek}}{\underset{\text{Satz}}{\Longrightarrow}} \bigvee_{*} \text{ rg } S_n A_1 \cdot\cdot A_n = \tilde{S}_n \underbrace{A_1 | \text{ rg } A_1 \cdot\cdot A_n | \text{ rg } A_n}$$