

HW 8, due Monday, March 25: problems 4 and 10 on pp. 85,86 of the book. (For Friday, March 15, do problems 2,3 on that page but don't hand them in.)

Solution of 4. The posets of diagram I and II on p. 79 satisfies σ , and the posets of diagrams III and IV satisfy $\neg\sigma$

Solution of 10. Here we use abbreviations like $v|x$ and $P(x)$ as indicated on p. 83. It is tacitly assumed in this exercise that the definitions should be valid for the standard model \mathcal{N} of arithmetic.

(a) ' x and y are relatively prime' is defined by the formula

$$\forall v((v|x \wedge v|y) \rightarrow v = S(0))$$

(b) ' x is the smallest prime greater than y ' is defined by the formula

$$P(x) \wedge y < x \wedge \forall z((P(z) \wedge y < z) \rightarrow x \leq z)$$

(c) ' x is the greatest number with $2x < y$ ' is defined by the formula

$$2x < y \wedge \forall z(2z < y \rightarrow z \leq x)$$