

Logics and Mathematics – 5th lecture

Exercise sheet

Preining Norbert

Problem 1 Prove the following statement:

For all natural numbers n bigger than 8, there are natural numbers k and l such that

$$n = 3k + 5l$$

Hint: $P(n) : n + 8 = 3k + 5l$, use strong induction

Problem 2 With the following definition

$$a_1 = 1$$

$$a_2 = 8$$

$$a_{n+2} = 2a_n + a_{n+1}$$

prove the following statement:

$$a_n = 3 \cdot 2^{n-1} + 2(-1)^n$$