Řešitelský seminář, 18. 4. 2017

Problem 1. *Let $p(x)$ be the polynomial $x^3 + 14x^2 - 2x + 1$ Let $p^{(n)}(x)$ denotes $p(p^{(n-1)}(x))$. Show that there is an integer N such that $p^{(N)}(x) - x$ is divisible by 101 for all integers x.*

Problem 2. *Find the number of integers c such that $-2007 \leq c \leq 2007$ and there exists an integer x such that $x^2 + c$ is a multiple of 2^{2007}.*

Domácí úloha

Problem 3. *Let (a_n) be a sequence of nonzero real numbers. Prove that the sequence of functions $f_n : \mathbb{R} \to \mathbb{R}$*

$$f_n(x) = \frac{1}{a_n} \sin(a_n x) + \cos(x + a_n)$$

has a subsequence converging to a continuous function.