



PUTNAM EXAM SEMINAR
FALL 2010

ASSIGNMENT 1
DUE SEPTEMBER 8

Exercise 1. Define a sequence $\{a_n\}$ by $a_1 = 1$ and $a_{n+1} = \cos[\arctan(a_n)]$ for $n \geq 1$. Find a formula for a_n and determine $\lim_{n \rightarrow \infty} a_n$.

Exercise 2. Let $n \geq 1$. Prove that $2^{2^n} - 1$ has at least n distinct prime factors.