PUTNAM EXAM SEMINAR
FALL 2013

QUIZ 1
SEPTEMBER 11

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

Exercise 2. Prove that for any $k \geq 1$,

$$2\cos\frac{\pi}{2^{k+1}} = \underbrace{\sqrt{2+\sqrt{2+\sqrt{2+\cdots+\sqrt{2}}}}}_{k \text{ terms}}.$$