Matthew S Brennan* (brennann@mit.edu), 450 Memorial Drive, Apt. H416, Cambridge, MA 02139. Ramsey numbers of trees and unicyclic graphs versus odd cycles and fans.

The generalized Ramsey number $R(H, K)$ is the smallest positive integer $n$ such that for any graph $G$ with $n$ vertices either $G$ contains $H$ as a subgraph or its complement $\overline{G}$ contains $K$ as a subgraph. Burr, Erdős, Faudree, Rousseau and Schelp initiated the study of Ramsey numbers of trees versus odd cycles, proving that $R(T_n, C_m) = 2n - 1$ for all odd $m \geq 3$ and $n \geq 756m^{10}$, where $T_n$ is a tree with $n$ vertices and $C_m$ is an odd cycle of length $m$. They proposed to study the minimum positive integer $n_0(m)$ such that this result holds for all $n \geq n_0(m)$, as a function of $m$. We prove that $R(T_n, C_m) = 2n - 1$ for all odd $m \geq 3$ and $n \geq 64m$. Combining this with a result of Faudree, Lawrence, Parsons and Schelp yields $n_0(m)$ is bounded between two linear functions, thus identifying $n_0(m)$ up to a constant factor. We also prove a conjecture of Zhang, Broersma and Chen for $m \geq 9$ that $R(T_n, F_m) = 2n - 1$ for all $n \geq m^2 - m + 1$ where $F_m$ denotes a fan on $2m + 1$ vertices consisting of $m$ triangles sharing a common vertex. We extend this result from trees to unicyclic graphs $UC_n$, which are connected graphs with $n$ vertices and a single cycle. (Received September 20, 2015)