1077-05-191 **Daniel S. Shetler** (dshetler12@my.whitworth.edu), Department of Mathematics, Whitworth University, Spokane, WA 99251, and **Michael Wurtz***, Department of Mathematics, Northwestern University, Evanston, IL 60208. *On Some Multicolor Ramsey Numbers Involving $K_3 + e$ and $K_4 - e$.*

The Ramsey number $R(G_1, G_2, G_3)$ is the smallest n such that for all 3-colorings of the edges of K_n there is a monochromatic G_1 in the first color, G_2 in the second color, or G_3 in the third color. We study the bounds on various 3-color Ramsey numbers $R(G_1, G_2, G_3)$, where $G_i \in \{K_3, K_3 + e, K_4 - e, K_4\}$. The minimal and maximal combinations of G_i's correspond to the classical Ramsey numbers $R_3(K_3)$ and $R_3(K_4)$, respectively, where $R_3(G) = R(G, G, G)$. Here, we focus on the much less studied combinations between these two cases.

Through computational and theoretical means we establish that $R(K_3, K_3, K_4 - e) = 17$, and by construction we raise the lower bounds on $R(K_3, K_4 - e, K_4 - e)$ and $R(K_4, K_4 - e, K_4 - e)$. For some G and H it was known that $R(K_3, G, H) = R(K_3 + e, G, H)$; we prove this is true for several more cases including $R(K_3, K_3, K_4 - e) = R(K_3 + e, K_3 + e, K_4 - e)$.

Ramsey numbers generalize to more colors, such as in the famous 4-color case of $R_4(K_3)$, where monochromatic triangles are avoided. It is known that $51 \leq R_4(K_3) \leq 62$. We prove the surprising theorem stating that if $R_4(K_3) = 51$ then $R_4(K_3 + e) = 52$, otherwise $R_4(K_3 + e) = R_4(K_3)$. (Received August 10, 2011)