1125-05-792 **Adam T O'Neal*** (oneala@marshall.edu), Huntington, WV , and **Michael Schroeder**, WV.
On sets of cardinality 2 of nondecreasing diameter.

Our problem comes from Ramsey theory. For positive integers m, r, and t, we say that a coloring of n integers, $[n]$, with r colors is (m, r, t)-*permissible* if there exist t monochromatic subsets $B_1, B_2, \ldots, B_t$ such that

(a) $|B_1| = |B_2| = \cdots = |B_t| = m$,

(b) $\max(B_i) < \min(B_{i+1})$ for $1 \leq i \leq t-1$, and

(c) $\max(B_{i+1}) - \min(B_{i+1}) \geq \max(B_i) - \min(B_i)$ for $1 \leq i \leq t-1$;
that is, the diameters of the subsets are nondecreasing.

Let $f(m, r, t)$ be the smallest integer n such that any coloring of $[n]$ is (m, r, t)-permissible. In this presentation, we fix $m = r = 2$ and show that $5t - 5 < f(2, 2, t) \leq 5t - 2$. We conjecture that $f(2, 2, t) = 5t - 4$ and prove the conjecture in certain cases. We conclude by investigating colorings with more than two colors. (Received September 15, 2016)