1058-05-62 **Steve Butler*** (butler@math.ucla.edu), UCLA Mathematics Department, Box 951555, Los Angeles, CA 90095-1555, and **Kevin Costello** (kcostell@math.gatech.edu) and **Ron Graham** (graham@ucsd.edu). *How to find a two coloring of* $\{1, 2, \ldots, n\}$ *that has few monochromatic constellations.*

A constellation pattern is a collection of rationals q_i with $0 \leq q_i \leq 1$. A constellation in $\{1, 2, \ldots, n\}$ is a scaled translated copy of the constellation pattern. For example, when the constellation pattern consists of the rationals $0, \frac{1}{2}, 1$; then a constellation in $\{1, 2, \ldots, n\}$ corresponds to a three term arithmetic progression.

For a given constellation pattern, we show a method to hunt for a two coloring of $\{1, 2, \ldots, n\}$ that has few (ideally fewest) monochromatic constellations. We also show that for constellation patterns with three points that there is *always* a coloring which beats random. (Received January 29, 2010)