1135-I5-1154 **Kendra E Pleasant*** (kendra.pleasant@morgan.edu). *Building Partition Regularity.*
Ramsey Theory is a mathematical study of combinatorial objects in which a certain degree of order must occur as the scale of the object becomes large. A standard problem in Ramsey Theory starts with some mathematical object and breaks it into several pieces. How big must the original object be for the pieces to have a certain property? This is described as *partition regularity.* Let $u, v, n \in \mathbb{N}$ and let A be a $u \times v$ matrix of rank n with integer entries. We show that there is a $u \times n$ matrix B with integer entries such that

$$\{A\vec{k} : \vec{k} \in \mathbb{Z}^v\} \cap \mathbb{N}^u = \{B\vec{x} : \vec{x} \in \mathbb{N}^n\} \cap \mathbb{N}^u\,.$$

We also consider similar results dealing with an arbitrary commutative cancellative semigroup $(S, +)$ and its group of differences, G. (Received September 19, 2017)