

Inhomogeneous Partition Regularity

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We say that the system of equations $Ax = b$, where A is an integer matrix and b is a (non-zero) integer vector, is 'partition regular' if whenever the integers are finitely coloured there is a monochromatic vector x with $Ax = b$. Of course, this is trivially the case if the system of equations has a constant solution, and Rado showed that this sufficient condition is in fact necessary. We will give a new proof of Rado's result, and will build on this to answer questions of several authors about extending the result from the integers to general rings. This is joint work with Paul Russell.