Homogeneous and 1-Transitive Coloured, Countable Linear Orderings

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In this paper we tackle a classification problem for coloured linear orderings, that is, linear orderings in which each point is assigned a unique member of a set C, thought of as "colours". We restrict here to the countable case (so that also C may be taken to have cardinality at most $\aleph_0$), and, so that we have some chance of classification, impose a suitable homogeneity assumption. Now, if we require full homogeneity (sometimes called"ultrahomogeneity", [2]), meaning that any isomorphism between finite substructures extends to an automorphism, then the classification consists of just the so-called "C-coloured rationals" Q_C or structures built up from these and isolated points by concatenation, as we shall see in the last section. In the first sections rather we adapt Morel's classification [1] of the countable 1-transitive linear orders to the coloured case, where now "1-transitive" means that the automorphism group acts singly transitively on each set of points coloured by a fixed colour.

[1] A.C.Morel, A class of relation types isomorphic to the ordinals, Mich. Math. J. 12(1965), 317-321.

[2] A.H.Lachlan and R.E.Woodrow, Countable ultrahomogeneous undirected graphs, Trans. Amer. Soc. 262(1980), 51-94.

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