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Augmented trees and constructing hypergraphs with large girth and chromatic number.

An *r*-augmented tree is a rooted tree with *r* edges added from each leaf to ancestors. For natural numbers *d, g, r*, we construct a bipartite *r*-augmented complete *d*-ary tree having girth at least *g*. The resulting graphs can be used to give several constructions of sparse graphs with large girth and large (list-)chromatic number. In particular, a concise explicit construction of uniform hypergraphs with large girth and large chromatic number will be presented. (Received September 24, 2017)