

The degree sequence of a random graph

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We devise a new method to count the number of graphs with a given degree sequence asymptotically. As a consequence we determine that the degree sequence of a random graph on n vertices behaves asymptotically like n suitably chosen independent binomials. This was known previously only for edge densities p that satisfy $p = o(1/\sqrt{n})$ or $p \geq 1/\log n$.

The asymptotic number of d -regular graphs on n vertices, for all d , is a particular instance of our enumeration result.

We further extend our methods to give asymptotic formulae for the number of bipartite graphs and digraphs of a given degree sequence.