

Sharp Bounds for Decomposing Graphs into Edges and Triangles

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Let $\pi_3(G)$ be the minimum of twice the number of K_2 's plus three times the number of K_3 's over all edge decompositions of a graph G into copies of K_2 and K_3 . Let $\pi_3(n)$ be the maximum of $\pi_3(G)$ over graphs with n vertices. This specific extremal function was studied by Gyóri and Tuza, and recently improved by Král, Lidický, Martins and Pehova. We extend the proof by giving the exact value of $\pi_3(n)$ for large n and classify the extremal examples. We also provide a generalization to K_2 and K_3 decompositions with different weight ratios.

Keywords: graphs, decompositions