

3-colourability and diamonds

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The 3-colourability problem is an NP-complete problem which remains NP-complete for claw-free graphs and for graphs with maximum degree four. In this talk we will consider induced subgraphs, among them are the *claw* ($K_{1,3}$), the *bull* (a triangle with two pendent edges), and the *diamond* (the graph $K_4 - e$).

Our main result is a complete characterization of all 3-colourable (*claw, bull*)-free graphs. We will present a description of all non 3-colourable (*claw, bull*)-free graphs in terms of diamonds. Moreover, we will show extensions of this characterization to larger graph classes by taking supergraphs of the claw or the bull.