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3-colorable Subclasses of P_8 -free Graphs

We study 3-colorable graphs having no induced 8-vertex path P_8 and no induced cycles C_k of two specific small lengths k . We characterize three such cases. Namely, we show that if no C_3 and no C_4 are allowed, then by way of structural decomposition, all such graphs are 3-colorable. Same holds for the case where no C_3 and no C_5 are allowed. For the case with no C_4 and no C_5 , we find all critical graphs.

Joint work with Maria Chudnovsky.