On the Orbital Chromatic Polynomial

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The orbital chromatic polynomial, introduced by Cameron and Kayibi in 2007, counts the number of proper λ-colorings of a graph modulo a group of symmetries. The polynomial has been investigated for specific graphs, including the Petersen graph, complete graphs, null graphs, paths, and cycles of small length. So far, no general formula for the orbital chromatic polynomial of the n-cycle for arbitrary n has been established.

In this talk we present such formula for the group of rotations and the full automorphism group of the n-cycle. As a side result, we obtain a new proof of Fermat's little theorem.

References

[1] K. Dohmen, M. Lange-Geisler, The Orbital Chromatic Polynomial of a Cycle, url: `https://arxiv.org/abs/2009.08235`.