Babaei, Esmaeil; Zamani, Yousef; Shahryari, Mohammad
Symmetry classes of polynomials. (English) Zbl 1338.05272
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Summary: Let G be a subgroup of S_m and suppose χ is an irreducible complex character of G. Let $H_d(G,\chi)$ be the symmetry class of polynomials of degree d with respect to G and χ. Let V be an $(d+1)$-dimensional inner product space over $\mathbb{C}$ and $V_\chi(G)$ be the symmetry class of tensors associated with G and χ. A monomorphism $H_d(G,\chi)\to V_\chi(G)$ is given and it is used to obtain necessary and sufficient conditions for nonvanishing $H_d(G,\chi)$. The nonexistence of o-basis of $H_d(S_m,\chi^\pi)$ for a certain class of irreducible characters of S_m is concluded. The dimensions of symmetry classes of polynomials with respect to the irreducible characters of S_m and A_m are computed.

MSC:

05E05 Symmetric functions and generalizations
15A69 Multilinear algebra, tensor calculus
20C30 Representations of finite symmetric groups

Keywords:

alternating group; irreducible characters; orthogonal basis; symmetry class of polynomials; symmetry class of tensors; symmetric group

Full Text: DOI

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