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Summary: Generalized trigonometric functions with two parameters were introduced by Drábek and Manásevich to study an inhomogeneous eigenvalue problem of the $p$-Laplacian. Concerning these functions, no multiple-angle formula has been known except for the classical cases and a special case discovered by Edmunds, Gurka and Lang, not to mention addition theorems. In this paper, we will present new multiple-angle formulas which are established between two kinds of the generalized trigonometric functions, and apply the formulas to generalize classical topics related to the trigonometric functions and the lemniscate function.

MSC: 33E20 Other functions defined by series and integrals

Keywords: multiple-angle formulas; generalized trigonometric functions; $p$-Laplacian; eigenvalue problems; pendulum equation; lemniscate

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References: