

GAUSS-TYPE QUADRATURE RULES FOR VARIABLE-SIGN WEIGHT FUNCTIONS

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When the Gauss quadrature formula G_n is applied, it is usually assumed that the weight function (or the measure) is non-negative on the integration interval $[a, b]$. In the present paper, we introduce a Gauss-type quadrature formula Q_n for weight functions that change the sign in the interior of $[a, b]$. It proves that all nodes of Q_n are pairwise distinct and contained in the interior of $[a, b]$. Moreover, G_n (with a non-negative weight function) turns out to be a special case of Q_n . Obtained results on the remainder term of Q_n suggest that the application of Q_n makes sense both when the points from the interior of $[a, b]$ at which the weight function changes sign are known exactly, as well as when those points are known approximately. The accuracy of Q_n is confirmed by numerical examples.

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