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Brian Christopher Pennington* (brian_pennington@baylor.edu), Department of Mathematics, Baylor University, Waco, TX 76798-7328. *Boundary data smoothness for solutions of nonlocal boundary value problems for n th order differential equations.*

Under certain conditions, solutions of the n th order boundary value problem, $y^{(n)} = f(x, y, y', \dots, y^{(n-1)})$, $y(a) - \sum_{k=1}^p a_k y(\xi_k) = y_1$, $y^{(i-1)}(\gamma) = y_i$, for $2 \leq i \leq n-1$, and $y(b) - \sum_{l=1}^q b_l y(\eta_l) = y_n$, are differentiated with respect to boundary conditions, where $c < a < \xi_1 < \dots < \xi_p < \gamma < \eta_1 < \dots < \eta_q < b < d$, $a_1, \dots, a_p, b_1, \dots, b_q \in \mathbb{R}$, and $y_1, \dots, y_n \in \mathbb{R}$. The method involves application of a Peano Theorem for initial value problems. (Received August 15, 2017)