On some interpolation operators on triangles with curved sides

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ABSTRACT

We present some results regarding interpolation operators and linear, positive operators defined on triangles having one curved side. They come as an extension of the corresponding operators for functions defined on triangles with straight sides. The operators defined on domains with curved sides permit essential boundary conditions to be satisfied exactly.

We consider some Lagrange, Hermite and Birkhoff type interpolation operators, as well as some Nielson, Marshall and Bernstein type operators on triangles with one curved side. We construct their product and Boolean sum and study their interpolation properties.

We study three main aspects of the constructed operators: the interpolation properties, the orders of accuracy and the remainders of the corresponding interpolation formulas.

Finally, we give some numerical examples and we study and compare the maximum approximation errors for the operators presented here.