We describe and examine a test for shape constraints, such as monotonicity, convexity (or both simultaneously), U-shape, S-shape and others, in a nonparametric framework using partial sums empirical processes. We show that, after a suitable transformation, its asymptotic distribution is a functional of the standard Brownian motion, so that critical values are available. However, due to the possible poor approximation of the asymptotic critical values to the finite sample ones, we also describe a valid bootstrap algorithm. In addition, we outline how the methodology can be extended to a framework when more than one covariate is present and no shape-related properties are imposed on them.