Article

On Some New Contractive Conditions in Complete Metric Spaces

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Abstract: One of the main goals of this paper is to obtain new contractive conditions using the method of a strictly increasing mapping $\mathbf{F}: (0, +\infty) \to (-\infty, +\infty)$. According to the recently obtained results, this was possible (Wardowski's method) only if two more properties (F_2) and (F_3) were used instead of the aforementioned strictly increasing (F_1). Using only the fact that the function $\mathbf{F}$ is strictly increasing, we came to new families of contractive conditions that have not been found in the existing literature so far. Assuming that $\alpha(\mathfrak{u}, \mathfrak{v}) = 1$ for every $\mathfrak{u}$ and $\mathfrak{v}$ from metric space Ξ, we obtain some contractive conditions that can be found in the research of Rhoades (Trans. Amer. Math. Soc. 1977, 222) and Collaco and Silva (Nonlinear Anal. TMA 1997). Results of the paper significantly improve, complement, unify, generalize and enrich several results known in the current literature. In addition, we give examples with results in line with the ones we obtained.

Keywords: α-admissible mappings; triangularly α-admissible mappings; $\mathbf{F}$-contraction; fixed point; contractive condition

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