Summaries

On approximate solutions of the Pexider equation

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Let X be an abelian (topological) group and Y a normed space. In this paper the following functional inequality is considered:

$$\begin{aligned} & \|f(x+y) - g(x) - h(y)\| \\ & \leq \mathcal{E} \cdot \max(\min)\{\|f(x+y) - f(0)\|, \|g(x) - g(0) + h(y) - h(0)\|\} \\ & \text{for } x, y \in X \text{ where } f, g, h: X \rightarrow Y \text{ and } \mathcal{E} \in [0, 1). \end{aligned}$$

This inequality is a similar generalization of the Pexider equation as J. Tabor's generalization of the Cauchy equation (cf. [3], [4]). The solutions of our inequality has similar properties as the solutions of the Pexider equation. Continuity and related properties of the solutions are investigated as well.

Functional equations associated with triangle geometry

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Triangle geometry is treated in the context of functional equations of three variables a, b, c which may be regarded as the sidelengths of a variable triangle. Triangle *centers* (e.g., incenter, circumcenter, centroid), and *central lines* (e.g., the Euler line) are defined and partitioned into classes: *0-centers*, *1-centers*, *2-centers* and *0-lines*, *1-lines*, and *2-lines*. Criteria for parallelism, perpendicularity, and other geometric relations are proved in terms of these classes. The Euler line and central lines parallel or perpendicular to the Euler line serve as examples.