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Al-Kāshī, the first scientist who introduced dynamical system (Conference Paper)

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Abstract

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In 15th century, two renowned mathematicians, Ghiyāth al-Dīn Jamshīd Mas'ūd al-Kāshī (also known as Jamshīd Kāshānī; d. 1429) and his patron, Mīrzā Muhammad Tāraghay bin Shāhrukh (well known as Ulugh Beg; d. 1449) were able to calculate the sine and chord of one-third of an angle. With this, they successfully computed sine 1°to 17 correct decimal digits (ten correct sexagesimal places) by the invention of ingenious converging iteration algorithm. The iteration algorithm suggested by Al-Kāshī one can consider as pioneering dynamical system and Al-Kāshī himself can be considered as the initiator, pioneer of the theory of dynamical systems. In this paper we revise Al-Kāshī's work on this computation of sine 1°using modern theory of dynamical systems. The main reference for this computation will be based on A Study of Risāla al-Watar wa'l Jaib ("The Treatise on the Chord and Sine"), written by Mohammad K. Azarian. In the end, we discuss the significance of this revision in the Islamic point of view. © 2018 Author(s).

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