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Mohammad K. Azarian* (azarian@evansville.edu), Department of Mathematics, University of Evansville, 1800 Lincoln Avenue, Evansville, IN 47722. *The Famous Cubic Equation of Ghiyath al-Din Jamshid Mas'ud al-Kashi [Jamshid Kashani] and Mathematica*. Preliminary report.

Ghiyath al-Din Jamshid Mas'ud al-Kashi [Jamshid Kashani] (1380-1429) discussed the calculation of $\sin 1^\circ$ in his *Risala al-watar wa'l jaib* ("The Treatise on the Chord and Sine"). Al-Kashi applied Ptolemy's theorem to an inscribed quadrilateral to obtain his famous cubic equation, and then he invented an iteration algorithm to calculate $\sin 1^\circ$. For his calculations he used the value of $(1/3)\sin 3^\circ$ with 9 sexagesimal places of accuracy, and he obtained $\sin 1^\circ$ with nine correct sexagesimal places as well. Our goal in this presentation is to use $(1/3)\sin 3^\circ$ with higher accuracies, and apply Mathematica to obtain approximations for $\sin 1^\circ$. As expected, there will be significant improvement on the accuracy of the value of $\sin 1^\circ$. Surprisingly, this improvement does not continue indefinitely as we use more accurate values for $(1/3)\sin 3^\circ$. (Received September 13, 2017)