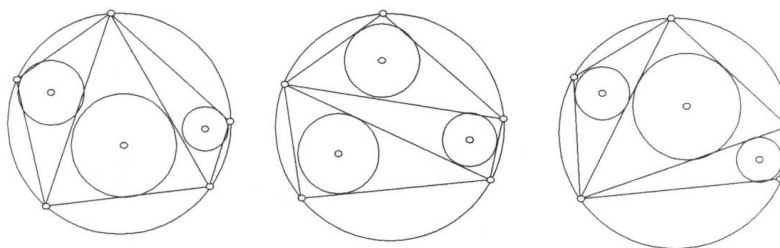


IN SEARCH OF ‘THE JAPANESE THEOREM’

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Note. The letters ‘I’, ‘U’, and ‘M’ refer to the first, second and third author. Our previous two papers show a variety of proofs of this theorem, seven in all, by Japanese mathematicians [1]. This paper relates the history and cultural setting of the theorem. It relies heavily on Prof. U’s article [21].

Japanese Theorem. Triangulate a cyclic polygon by lines drawn from any vertex. The sum of the radii of the incircles of the triangles is independent of the vertex chosen.



Introduction. In 1996 a Masters Degree student at my university did her thesis on this theorem. It caught our attention when we saw an article in *The Mathematical Gazette*, where the theorem was stated without a proof [14]. After the theorem was proved [7], we began to wonder why it is called the ‘Japanese Theorem’. Is the theorem perhaps very well-known in Japan? We made many inquiries both here and abroad. Finally, the answer came from Prof. Yoshida of Kyoto University. He sent a 15-page fax containing material in English, French, and Japanese. According to Prof. Yoshida the theorem is not so well-known in Japan [22].

The faxed material contained more interesting information. Around 1900 AD the quadrangle case (when the polygon is a quadrilateral) of the theorem had come to Japan from China. So, in Japan it was known as the ‘Chinese Theorem’. The theorem soon attracted many Japanese mathematicians. It was inscribed on a wooden tablet (called *Sangaku* in Japanese)