

Trisecting Obtuse Angle With Abe's Method

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Abstract

In 1837, Pierre Wantzel proved that it is not possible to trisect an arbitrary angle by using only the compass and straightedge construction. But in during the time, many of mathematicians have solved this problem by using different methods by testing and using various tools.

One of this methods is origami. In this paper, we try to use the traditional art of Japan named "Origami" and the geometric relations governing it to examine the ways of trisecting an angle. In 1980, Hisashi Abe introduced a pattern for trisecting an acute angle with origami method. Also, Jacques Justin provided a different pattern by defining the angle in the form $(180^\circ - \alpha)$ for the obtuse angle.

In this paper, we present a new pattern for trisecting an obtuse angle by defining the angle in the form $(90^\circ + \alpha)$ by using origami method. We want to trisect $(90^\circ + \alpha)$ where $\alpha < 90^\circ$, then since $(90^\circ + \alpha)/3 = (30^\circ + \frac{\alpha}{3})$, we can trisect α to get $\frac{\alpha}{3}$ with Abe's method, then trisect 90° to get 30° , and we will have $(30^\circ + \frac{\alpha}{3})$.

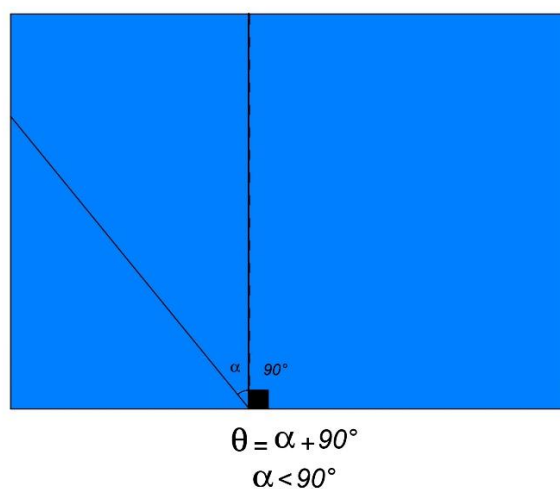


Figure 1: θ angle.