

RESEARCH STATEMENT

Original Creative Work

Citation: Noel Patson 2010, Recorded or Rendered Work, Web Exhibition, *Equal Incircles along a Line*, Wolfram Mathematica.

<http://demonstrations.wolfram.com/EqualIncirclesAlongALine/>

Research Background

Japanese mathematics flourished during Edo period 1603-1867 and was depicted on wooden tablets called Sangaku. There is a rich history of geometric theorems and problems recorded on these tablets. Consider the incircle C of radius r of any triangle (each side of the triangle is tangent to the circle) and the extended line L along one side of the triangle. Construct a triangle with base common to L and an incircle of radius r on either side of the triangle. Continue this process on either side of the group of triangles until n triangles are constructed, $n > 2$. The incircle of the triangle formed by the combination of any a , $2 \leq a < n$, adjacent triangles taken from the group of individual n triangles has the same radius as the incircle of the triangle formed by any other a adjacent triangles.

The demonstration allows the user to adjust the radii of the smallest circles; the number of small circles and position of the point common to all triangles. This approach is appealing to both kinaesthetic and visual learners.

Research Contribution

- Innovation – This presentation is the first time this particular Sangaku (Equal incircles along a line) has been represented with the control features. The demonstration illustrates the mathematical truth and beauty of the theorem. It is a fresh approach to presenting ancient traditional Japanese mathematics.

Research Significance

The demonstration has been through a rigorous review process[†].

[†] <http://demonstrations.wolfram.com/FAQ.html>

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