

A Curve for Halloween

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1 Introduction

Fermat discussed the curve which is now called *Witch of Agnesi*, and Guido Grandi gave its mathematical construction in 1703. Because of its shape, Grandi named the curve ‘versoria’ — Latin for ‘rope that turns a sail.’ In her 1748 book *Instituzioni analitiche ad uso della giovent italiana*, Maria Agnesi referred to the curve as ‘la versiera,’ the Italian rendering of the Latin ‘versoria.’

2 Mathematical expression

The curve may be given by its Cartesian equation (Famous Curves Index [1]):

$$y(x^2 + a^2) = a^3 \tag{1}$$

or parametrically as:

$$x = at, y = \frac{a}{(1 + t^2)} \tag{2}$$

3 Historical note

According to The MacTutor History of Mathematics [2], the curve has come to be known as “The Witch” due to an error in John Colson’s English translation of Agnesi’s *Instituzioni analitiche*. Colson confused ‘la versiera’ with ‘l’aversiera’ — ‘the witch’ or ‘the she-devil’ in English. The form of the graph, shown in Figure 1, may explain his mistake.

Witch of Agnesi

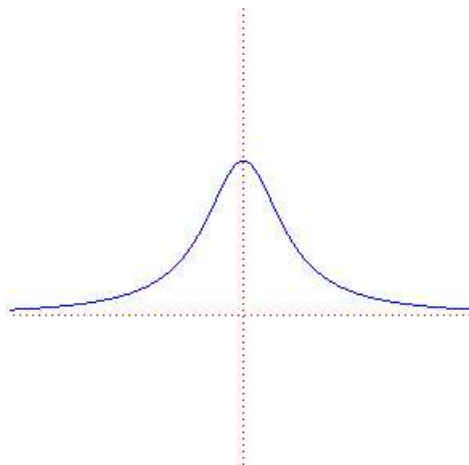


Figure 1: Witch of Agnesi

References

- [1] Famous Curves index.
<http://www-groups.dcs.st-and.ac.uk/history/Curves/Curves.html> [August 28, 2005].
- [2] The MacTutor History of Mathematics archive biographies index.
<http://www-groups.dcs.st-and.ac.uk/history/Mathematicians/Agnesi.html> [August 28, 2005].