

In Search of Heron: On the Area of a Triangle

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In approximately 100 AD, Heron of Alexandria proved that the area of a triangle is given in terms of its semiperimeter. While many proofs of this fact exist using a variety of techniques, Heron proved this result based entirely on geometric relationships and certainly long before the convenience of algebraic notation. This made us wonder about the nature of the formula itself and in particular, why the area of a triangle is linked to its semiperimeter. To explore this, we looked to his original work (translated from the Greek). In keeping with the spirit of the proof, we have included all of Heron's original historical text. We work alongside Heron through his proof of the result, breaking it down into six steps for a modern audience. We conclude with a brief discussion of the value and utility of historical sources, such as Heron's text, in the classroom.

Keywords: Heron's formula, area of a triangle, semiperimeter, historical sources



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For nearly fifty years, **Marty Bonsangue** taught all levels of mathematics from grade school to graduate school. He recently retired from the Mathematics Department at California State University, Fullerton, and now lives on the central California coast hanging out with his grandchildren. When he is not babysitting, daughter Jennifer keeps him busy working on projects in mathematics history.