

## Formulas of Heron

**Albert Natian**

*Los Angeles Valley College*

Heron's formula is but one instance of a class of similar formulas. A triangle may be thought of having three degrees of freedom represented by a threesome in various ways, such as its three sides; a pair of sides along with the included angle in between; the three altitudes; the medians; a median, an altitude and a side; or other combinations consisting of three parts. Maybe it is fitting to regard such formulas under the heading of *Heron's Formulas*. Here, we will show the derivations of the area of a general triangle in terms of a few threesomes, such as the three sides, three altitudes, three medians, and so forth.

Keywords: Heron's formula, area of a triangle, geometry



**Albert Natian** ([Albert.Natian@gmail.com](mailto:Albert.Natian@gmail.com)) has been a professor of mathematics at Los Angeles Valley College for over 30 years. A collector of sorts, he holds master's degrees in pure math, applied math, mathematical finance, and physics. His interests include combinatorics, applied probability, classical and modern physics, and philosophy. He enjoys mathematical puzzles, especially those involving probability. In his downtime, he does conceptual pen and ink drawings that involve patterns and objects in uncommon spatial relationships.