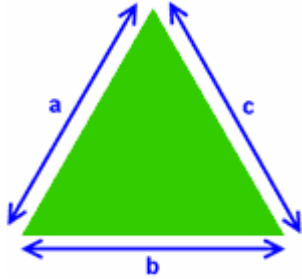


Heron's Formula



Area of a Triangle from Sides

You can calculate the area of a triangle if you know the lengths of all three sides, using a formula that has been known for nearly 2000 years.

It is called "Heron's Formula" after Hero of Alexandria (see below)

Just use this two step process:

Step 1: Calculate "s" (half of the triangle's perimeter) using:

$$s = \frac{a + b + c}{2}$$

Step 2: Then calculate the **Area** using:

$$A = \sqrt{s(s - a)(s - b)(s - c)}$$

Example: What is the area of a triangle where every side is 5 long?

Step 1: $s = (5+5+5)/2 = 7.5$

Step 2: $A = \sqrt{(7.5 \times 2.5 \times 2.5 \times 2.5)} = \sqrt{(117.1875)} = \mathbf{10.825...}$

Hero of Alexandria

The formula is credited to Hero (or Heron) of Alexandria, who was a Greek Engineer and Mathematician in 10 – 70 AD.

Amongst other things, he developed the **Aeolipile**, the first known steam engine, but it was treated as a toy!

Angles

In the calculator above I also used the [Law of Cosines](#) to calculate the angles (to provide a complete solution). The formula is:

$$C = \cos^{-1}\left(\frac{a^2 + b^2 - c^2}{2ab}\right)$$

Where "C" is the angle **opposite** side "c".

c