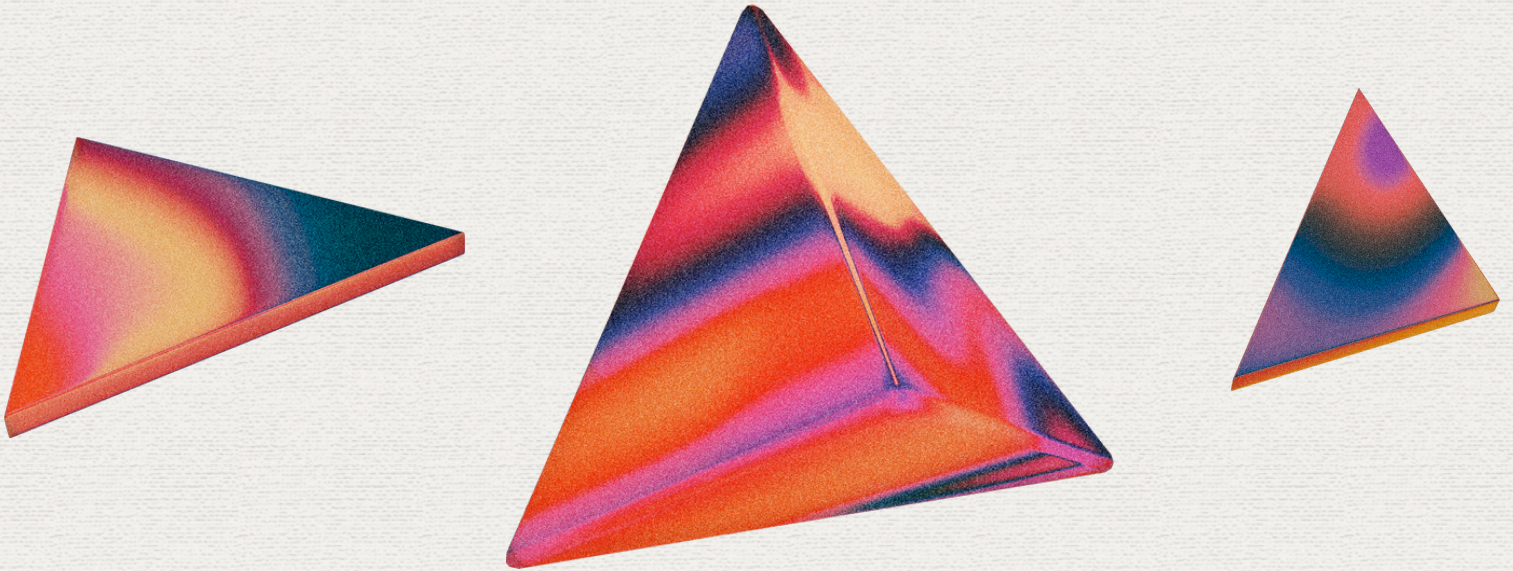


Distressing Math Collective Presents

Euler's Proof of Heron's Formula

Presented By: William Dunham
Research Associate in Mathematics Bryn Mawr College



My favorite theorem from Euclidean geometry is Heron's formula. This gives the area of a triangle in terms of the lengths of its three sides. Specifically, if the triangle's sides are of length a , b , and c , then the triangular area is

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

where $s = (a+b+c)/2$ is half the triangle's perimeter.

At first glance, the formula looks like a typo. Fear not: it is perfectly correct. The oldest proof is due to its namesake, Heron, who lived in classical times. Over the centuries, others have devised proofs, the cleverest of which – I think – is that published by Leonhard Euler in 1748.

For this DMC, I'll present Euler's proof. Nothing about it is advanced. You'll understand every step, for it involves only Euclidean (i.e., high school) geometry. But I doubt that many people have seen high school geometry as breathtaking as this.

September 18th, 2024 | 7:00 PM
Park 245 or via Zoom

Zoom Info:
Meeting ID: 958 0798 2212
Passcode: 792030