Three formulas that can save your life

…OK fine, maybe they are just good to know!

Iván Ramírez

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Date: Tuesday, November 5

Time: 12:00 - 12:50 pm

Location: Room 703, Thackeray Hall

Iván completed his undergraduate studies in Mathematics at Universidad de Costa Rica. Later, he completed his Masters in Mathematics at East Tennessee State University. Currently, Iván is a PhD student at Pitt, working under Dr. Jon Rubin and Dr. David Swigon. His area of research focuses on the development of mathematical models to study the underlying dynamics of problems arising from immunology, epidemiology, population dynamics, and many other areas of the life sciences.

I will present a simple proof of the Wallis formula using basic concepts of calculus. The Wallis formula states

$$\lim_{n \to \infty} \frac{(n!)^2 2^{2n}}{(2n)!\sqrt{n}} = \sqrt{\pi}.$$

I will also show how the Wallis formula can be used to prove Stirling's formula, which says

$$\lim_{n \to \infty} \frac{n! e^n}{n^{n+1/2}\sqrt{2\pi}} = 1.$$

Finally, I will talk about the Darboux formula, which states if f is any Riemann integrable function in $[0,1]$ then

$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{1}{n} f(k/n) = \int_0^1 f(x)\,dx.$$

Some examples on how these wonderful formulas can be used in practice will also be presented. Food and drinks will be provided!

SPEAKER(S) FOR NEXT WEEK:

Dr. Wang-Erickson

Organized by: Derek Orr, Tom Everest, Jeremiah Morgan, and Jeff Wheeler