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New and Noteworthy Titles on our Bookshelf
January 2022

The Secret Formula: How a Mathematical Duel Inflamed Renaissance Italy and Uncovered the Cubic Equation
by Fabio Toscano

Imagine yourself in a world where people held (and excitedly attended!) day-long math duels, where mathematical rivalries were born and thrived over handwritten letters filled with traps aimed to trick your correspondent into revealing what they wished to keep secret, and where respected medical professionals were also at the forefront of developing cutting-edge mathematics. If you are anything like me, you might be thinking such a place does not exist. I encourage you to pick up Toscano’s The Secret Formula and enjoy being proven wrong.

The Secret Formula tells the story of the discovery of the general solution to cubic equations, which took place in Italy just before the Renaissance. This breakthrough, the first in roughly 3,000 years, would reinvigorate the field of algebra. Niccolo Tartaglia found the solution after being challenged to a math duel during a time when solving a specific cubic equation was nothing to be laughed at. Interestingly, Tartaglia refused to publish his solution. Instead, he kept it a secret for years, only sharing it, via a poem, with two people who were sworn to secrecy. His unwillingness to share his discovery made him the target of many plots attempting to trick him into unveiling the solution. Toscano beautifully weaves his own narration with words written by Tartaglia and his contemporaries and those of historians, allowing the book to transport the reader directly into the scenes and mental battles Toscano describes.

This book does not require any formal mathematical training, so it can be appreciated by mathematicians and general readers alike. The book is an engrossing and delightful read for people with a mathematical interest as well as those interested in history. The vivid historical picture it paints would make it an excellent choice for a history of math class or even a first-year seminar geared toward math majors.

Everyday Chaos: The Mathematics of Unpredictability, from the Weather to the Stock Market
by Brian Clegg

Have you ever wondered why bringing a microphone too close to a speaker results in that high pitched screech or why fireflies seem to synchronize and all light up at the same time? These situations, and many others that we encounter on a routine basis, are linked to chaos and complexity. Everyday Chaos explores these ideas from the ground up. Chaotic behavior occurs when the outcome of an event is deterministic, yet unpredictable. Newton first stumbled on chaotic behavior when he attempted to consider the impact of movement in a system comprised of the Earth, the Moon, and the Sun. Throughout the book, we are given examples where a slight change, such as the outcomes in billiards versus pinball, shifts from a system that nicely adheres to Newtonian physics to one that is highly chaotic.

Within the text, Clegg describes how chaotic systems arise in physics, astronomy, probability, and fractals, and then uses them to explain the chaos within everyday occurrences such as feedback loops, weather forecasting, gambling, the butterfly effect, artificial intelligence, and climate change, among many others.

This book does not require much mathematical background and makes for a light and enjoyable read for anyone interested in learning more about chaos and where it occurs. The text doesn’t dwell on mathematical details; nonetheless, mathematicians can find enjoyment in this book and all it has to offer if they are interested in learning about chaos at a non-mathematical level. It keeps a conversational tone and has threads that run throughout the entire book to help the reader follow the story and gain a better recognition of chaos. It is also packed with stunning pictures that illustrate each topic being discussed.