**Topic:** Gerolamo Cardano

**Notes on Topic:**

“Then entered perhaps the most bizarre character in the whole history of mathematics” JTG 135

Born in Milan  
Cardano recounts many hardships, illnesses and disabilities faced   
Among many odd adventures in his life, gambling became one to add to the list  
But from this came the book *Book on Games of Chance* which was the first serious treatise on the mathematics of probability

Cardano spent 1526 to 1532 in Sacco, starting a family, gambling, casting horoscopes  
He and his family headed back to Milan, but he was banned from practicing medicine, so he remained poor

Then Cardano began giving lectures to the educated and to nobility on medicine and mathematics and religion

After releasing a treatise claiming that the doctors of Italy are practicing bad medicine, which became very popular with the public, he was allowed to practice medicine finally  
Cardano quickly became the most sought after doctor in Italy, treating the Pope and travelling as far as Scotland to care for the Archbishop of St Andrew’s

His personal tragedies soon returned  
His wife died at age 31 leaving him with three children  
His oldest, a boy - Giambattista, started practicing medicine as well   
His boy also fell into unlucky trials, and married a woman who gave birth to three children, none of which were Giambattista’s   
Giambattista was so embarrassed by this infidelity he had prepared her a cake laced with arsenic -- and was soon after convicted of murder and beheaded in 1560

Cardano’s other son also fell into the life of crime and Cardano had him imprisoned more than once  
Cardano finally left Milan and went to a position of medicine at the University of Bologna, with him he took Fazio, his (illegitimate) grandson  
His misfortune continued -- he was arrested on charges of heresy for casting horoscopes of Jesus and writing the book *In Praise of Nero* about the anti-christian Roman leader

Cardano soon got out of prison, went to Rome and wound up with a pension from the Pope

Cardano spent his last days in Rome and died quietly -- “having fourteen good teeth, and one which is rather weak”  
  
Cardano was a self-contradictory character  
His collections fill thousands of pages with prolific work covering many topics, scientific and otherwise  
He was firmly planted in the modern, rational world, and also firmly stood in the superstitious world of the middle ages   
Gottfried Wilhelm Leibniz wrote, “Cardano was a great man with all his faults, without them, he would have been incomparable”  
  
**Back to the cubic**: In 1535….  
He heard wind of the challenge between Fior and Fontana and wanted to know more of the techniques of Fontana  
Cardano bluntly asked Fontana for his secrets  
He wrote many times to Fontana asking for the solution, and Fontana only ever responded saying he would write a book on his findings in his own time  
Cardano was initially angry, but eventually soothed things over and welcomed Fontana to Milan as his guest  
Fontana gave him the secret of the depressed cubic -- written in cipher -- to which Cardano took an oath

*I swear to you by the Sacred Gospel, and on my faith as a gentleman, not only never to publish your discoveries, if you tell them to me, but I also promise and pledge my faith as a true Christian to put them down in cipher so that after my death no one shall be able to understand them.*

A final character enters into this drama  
Ludovico Ferrari (1522-1565) arrived at Cardano’s door asking for work  
Ferrari soon went from servant to pupil to colleague of Cardano’s  
Cardano then shared the secret of the depressed cubic  
The two of them went on and made astounding progress  
  
Cardano then discovered how to solve the generic cubic equation but it relied on reducing this cubic into a depressed cubic and therefore could not publish this information for the oath he took with Fontana  
Ferrari discovered how to solve the quartic, but again by way of reducing it to depressed cubic  
Ferrari and Cardano travelled to Bologna and inspected papers of Scipione del Ferro and his solution to the depressed cubic, and felt he could then publish his results since his information was from del Ferro and not Fontana

Cardano published Ars Magna meaning “Great Art” because for him algebra was   
The book was forty chapters, and finally in chapter XI, “*On the Cube and the First Power Equal to a Number*”, Cardano approaches the subject of the depressed cubic

Cardano prefaced this chapter with the following:

*Scipio Ferro of Bologna well-nigh thirty years ago discovered this rule and handed it on to Antonio Maria Fior of Venice, whose contest with Niccolo Tartaglia of Brescia gave Niccolo occasion to discover it. He gave it to me in response to my entreaties, though withholding the demonstration. Armed with this assistance, I sought out its demonstration in [various] forms. This was very difficult.*

Fontana was still enraged, letters flew between him and Ferrari regarding the matter  
Fontana and Ferrari eventually challenged one another on Ferrari’s home turf, and Ferrari won

Mathematics historian Howard Eves noted, given Ferrari’s reputation and the hostile crowd, Fontana was lucky to escape alive  
  
Which brings us to the much sought after solution to the cubic

**Additional Suggested Reading**: None

**Assignment:** Homework 5 Problem 76