

Math 181

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Historical Biography

- Famous: Leonard Euler
- Not-Famous: E. J. Edmunds

• Life facts are important, and the source of those facts are important.

• How facts are used is important, and why facts are preserved.

What did Euler Do?

- Found/Discovered/Invented the constant e
- Invented sigma summation, function notation, radicals, π , etc.
- Euler's Formula

$$e^{i\phi} = \cos(\phi) + i\sin(\phi)$$

- Euler's Characteristic
- Other Euler's Constant

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Who was Euler?

- Born in Basel, Switzerland 1707
- Buried in Saint Petersburg, and lived much of his life in Berlin.
- 1720 began studies at University of Basel. (13 years old)
- 1726 wrote a dissertation

Wrote original research on the propagation of sound. He was 19 years old.

- 1727 Moves to St. Petersburg

He was wanted by Peter the Great, and generally found money and work as a scholar.

Euler does a ton of work and his work is still being published today. Currently over 80 large volumes have been released.

- 1738 Eye Problems

In St. Petersburg Euler lost vision in one of his eyes and so most images of him are from only one side.

- 1741 Leaves Russia for Berlin, Frederick the Great hires him at Berlin Academy.

Very tumultuous times, purges and political issues.

- 1766 Returns to St. Petersburg
- 1783 Dies of Natural Causes

Final years can't read or see anymore. Has to hire an assistant to read and write for him and still manages to produce many mathematical works.

Other Works by Euler

- Basel Problem

$$\sum_{n=1}^{\infty} \frac{1}{n^2}$$

Turns out:

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

Also Proved

$$\int_0^1 \frac{\sin(\ln(x))}{\ln(x)} = \frac{\pi}{4}$$

Using:

$$\frac{\sin(\ln(x))}{\ln(x)} = \frac{\ln(x) - \frac{\ln(x)^3}{3!} + \frac{\ln(x)^5}{5!} \dots}{\ln(x)}$$

- Proved Fermat number is not prime.

$$2^{(2^5)} + 1$$

Which has 10 digits.

- Königsburg Bridge Problem

Seven bridges in a city, can you find a path which watches each bridge only once. Turns out to be impossible and Euler came up with a good argument.

What did other people think of Euler

- Voltaire thought Euler to be simple and devoutly religious man. Boring outside of Math.

E. J. Edmunds

- Edmunds was a Free Person of Color in New Orleans
- Born Before the Civil War
- Unlike Euler who was so well known it makes it hard to figure out why we know what we know, Edmunds was recently rediscovered.

Recently rediscovered by Sian Zelbo in Colombia University Dissertation.

- Born 1851 in New Orleans
- Free Person of Color
Father is a clerk/salesman in dry goods company.

Family does well financially, and owns a home in Tremé. Father frequently travels to Europe for work. Likely spoke French.

- 1861 Civil War Breaks out (10 years old)
- 1862 Occupied by Union Soldiers

Both bad and good for Edmunds. Issues with occupation, but well positioned as a non-slaveholding wealthy family.

- 1870 Attended Fillmore School ("Whites only school")

He is fairly light skinned for a person of color, but it is unclear whether that affected his academic career.

- 1871 Goes to Paris and takes the exams to be admitted for the École Polytechnique.

École started out as an elite military school, with major math and science departments. Becomes a leading school and is a gateway to the top of French analysis.

Other mathematicians from École

- Cauchy
- Poincaré
- Poisson
- etc.

Edmunds is accepted with a 133/144, and is the bottom of his class.

- 1873 Passes exams, Set to do Artillery Training
- 1875 Decides to leave school and moves back to New Orleans

1874 is undocumented, and he likely works at a University but it isn't known.

- Publishes more than 200 short publications in Mathematics.
- To be Continued XD