Ethics in Mathematics: An Existence Theorem

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Themed Contributed Paper Session:
Ethics in the Mathematics Classroom
MathFest 2019

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Describing an ethics for mathematicians intersects with other conversations the community is having concerning social justice and equity.

- discuss the need for ethics in the mathematics profession,

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- discuss the need for ethics in the mathematics classroom,

In this talk, we will...

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- discuss the need for ethics in the mathematics classroom,

- share updates concerning where work on this problem is being done, and

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- raise questions that can frame future conversations.

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- Mathematical elitism and the myth of the "math genius"

Ethics in the mathematics profession

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Why does this matter?

We are training the next generation of mathematicians, data scientists, computer scientists, and statisticians. Articulating guidelines and standards supports those in the profession and forms our teaching.

Careful estimates place the number of mentally ill patients, epileptics and others in (German) institutions at 300,000 persons. What is the total yearly cost of this at four Reich marks per person per day? How many new Marriage Grant loans at 1000 marks each could this sum provide?

Loans required demonstrating ancestral and medical "fitness" and women had to leave work. This made more room for unemployed men.

The evolution of an infectious disease in a population can be modelled by

$$\dot{U} = U(1 - (U + I)) - \beta UI, \dot{I} = I(1 - (U + I)) + \beta UI - \delta I$$

where U is the uninfected population, I is the infected population, β is the rate of infection, and δ is the death rate of the disease. For $\beta = \frac{3}{4}$ determine the location and stability of the critical points in the cases: i) $\delta = \frac{1}{5}$, ii) $\delta = \frac{2}{5}$, iii) $\delta = \frac{3}{5}$.

Which of these values of δ gives the least total population in the long term? **At what level δ do you think there would be a health emergency? What factors impact this choice?**

Ethics in the mathematics classroom

There is a movement in K-12 education in the U.S. modeling an integration of ethical conversations into mathematics to support learning, interest, and transference of knowledge.

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Teaching Ethics (hopefully we will see more in talks today!)

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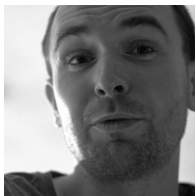
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Ethical Teaching

EⁱM Cambridge University Ethics in Mathematics Project

And us!

- What constitutes ethical mathematical practices, both in research and teaching?

- What role does undergraduate and graduate education play in promoting ethical mathematical practice? What are effective ways to integrate ethical mathematical practice within mathematics classes, both for programs inside and outside of the mathematical sciences?

- Call for a Committee on Ethics in the MAA.

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Visit www.ethicalmath.com

Thank you!