CAREER CHOICE

The Maths Ceiling

Treena Basu on why this is a good time as any to be a woman studying numbers, or differential equations

If you are a high school girl who enjoys mathematics but wonders whether the subject is really for you, I want you to know something important — it is. Mathematics is for anyone who is curious, persistent and willing to ask questions. And there has never been a more exciting time for young women to pursue it.

For much of history, mathematics was seen as a predominantly male discipline. Gradually things began to change. Women gained access to formal education, educational institutions became more inclusive, professional associations began advocating for greater representation and so on.

I decided to become a mathematician when I was in Class XI but my introduction to the joy of mathematical exploration was much earlier. When I was five or six years old, my father was working at Lockheed in the US. He would often carry a scientific calculator and graph paper in his briefcase. Every day, when he returned from work, I would take out the calculator and play with it. I would enter large numbers, perform calculations and write down the results. I was fascinated by the idea that numbers could be manipulated to produce answers.

At school, I began appreciating the logic behind mathematics. There was a certain satisfaction in arriving at a solution through reasoning rather than memorisation. I began to appreciate that mathematics was not about getting the correct answer. It was and always will be about understanding why an answer is correct.

My decision to pursue mathematics was supported by my parents, teachers and professors who encouraged my curiosity and gave me the confidence to continue. But passion alone does not make a mathematician. You also need to be comfortable with uncertainty, willing to make mistakes and prepared to spend considerable time on a problem that may not yield an immediate answer.



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NUMERO UNO: Shakuntala Devi is seen here demonstrating her ability to solve complex problems at an event in New York in 1976

I pursued a PhD in applied and computational mathematics at the University of South Carolina. At the postgraduate level, mathematics was no longer about applying established formulae or solving textbook exercises. It involved identifying meaningful questions, studying what was already known, developing mathematical approaches and testing whether those approaches could provide new insights.

My research exposed me to the connections between mathematical theory and practical problems, particularly in areas such as interpolation, non-parametric regression and time-series modelling. I became increasingly interested in how mathematical techniques could help me understand complex systems and make better decisions.

That connection between mathematical foundations and real-world applications has continued to shape my professional life. Today, my work spans data science, artificial intelligence, machine learning and emerging technologies. I still treat problems the same way I did at school: break the problem down, explore possible approaches and keep asking questions.

In July 2026, mathematician Hong Wang became the third woman in history to receive the Fields Medal, one of the highest international honours in mathematics. Before Wang, Maryam Mirzakhani made history in 2014 when she became the first woman to receive the Fields Medal. In 2022, Ukrainian Maryna Viazovska became the second woman to receive the Fields Medal. Three women, three different journeys and three extraordinary contributions. For a young girl considering mathematics, there is an important lesson here: there is no single route to becoming a mathematician. You can come from different countries, educational backgrounds and circumstances. You can develop an interest in mathematics early or discover it later. What matters is your willingness to explore ideas and pursue questions that interest you.

But perhaps the most important reason to study mathematics is it teaches you how to think — to take a complicated problem and break it into smaller pieces, to recognise patterns, question assumptions, test ideas.

Mathematicians work in fields such as AI, medicine, finance, climate science, cybersecurity, engineering, economics, technology and space exploration. It is also at the heart of data science and machine learning.

If you enjoy mathematics, don't let someone else's expectations decide how far you should take it. If a problem feels difficult, remember that difficulty is not evidence that you cannot solve the problem. In many cases, difficulty is exactly where mathematical thinking begins.

In the end you still may not become a mathematician. And that's fine. But mathematics may help you become a better scientist, engineer, doctor, economist... And when someone tells you that mathematics is not for girls, remember the women who came before you — and look at the women who are making mathematical history today.

Treena Basu is a fellow of the American Association for the Advancement of Science, serving at the US's National Institute of Standards and Technology. She is associate professor at Occidental College

